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WILLIAM McINNES, DIRECTOR

MEMOIR 126

No. 4, BIOLOGICAL SERIES

**A Botanical Exploration of the North
Shore of the Gulf of St. Lawrence
Including an
Annotated List of the Species
of Vascular Plants**

BY
Harold St. John



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PLATE I



Shingle beach and limestone sea-cliff at Eskimo island, Mingan islands.

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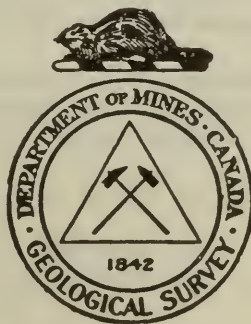
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OTTAWA
F. A. ACLAND
PRINTER TO HIS MOST EXCELLENT MAJESTY
1922

HAROLD B. LEE LIAISON
BRIGHAM YOUNG UNIVERSITY
PROVO, UTAH

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HAROLD ST. JOHN.

A Botanical Exploration of the North Shore of the Gulf of St. Lawrence; Including an Annotated List of the Species of Vascular Plants

NORTH SHORE OF THE GULF OF ST. LAWRENCE

The north shore of the gulf of St. Lawrence, the region familiarly known as the "côte nord," is the area to which this report relates. The area lies between Pentecôte river on the west and Blanc-Sablon river on the east, and forms part of the south shore of Saguenay county, province of Quebec. As used here the expression "south shore" has a broader meaning than its literal one. Of course many of the plants were collected at spots away from the actual shore-line, but because of the difficulty of inland travel, all the writer's collecting was done in the vicinity of the coast.

GEOLOGY

The area may be divided into two markedly different geological regions: (1) the dominant one, of Archæan gneiss, anorthosite, or occasional crystalline limestones, occupying the inland parts in all cases, and in most areas extending out to form the coastal regions and the islands; (2) one of sedimentary limestones, such as at Manowin island, Mingan islands, and the adjacent mainland, and the region bordering the strait of Belle Isle.

The following quotations from authoritative sources give a general idea of the geology of the area:

"With the exception of a narrow border of Silurian strata on the strait of Belle Isle, another at the mouth of the Mingan river, and a third near the Seven islands, . . . the north shore of the St. Lawrence is the southern boundary of this ancient series of deposits."¹ (Laurentian, chiefly granites and gneisses.)

"It is not until reaching the Mingan islands, between 500 and 600 miles to the northeastward, that we have any of its (calciferous formation) characteristic fossils. . . . At the Mingan islands and on the neighbouring coast, there appears an interesting extension of this formation extending from the Mingan river to Ste. Geneviève island, a distance of about 45 miles. It occupies the inner range of islands and most of the coast."²

¹ Geology of Canada, 1863, p. 47.

² Loc. cit., p. 119.

"Between this exposure (Mingan islands) and Bradore bay, the distance is about 300 miles. The shore, which is very much indented by bays and inlets, and fringed with a multitude of islands, presents an almost continuous line of bare rocks; but in no part of it have there been observed any strata, but such as belong to the Laurentian series. On the east side of Bradore bay, which is situated near the entrance of the strait of Belle Isle from the gulf of St. Lawrence, the Palæozoic rocks again present themselves. Resting on the Laurentian gneiss, they run along the north coast for nearly 80 miles, with a breadth of probably 10 or 12 miles. . . . On the strike these yellow-weathering limestones pass in some parts into grey, compact, pure limestone. . . . In Forteau bay, the whole mass appears to be more or less fossiliferous."¹

Referring again to the north shore of the strait of Belle Isle, "in very limited places along the shore are to be seen at first basal sandstones and these pass up more and more into arenaceous and pure limestones, all of which are of Lower Cambrian age."²

PHYSIOGRAPHY

As is the case along the north shore of the St. Lawrence, there occurs farther eastward along the north shore of the gulf a mountain range, or rather a range of hills, formed of Laurentian rocks. In many places they extend to the shore-line, forming in some cases cliffs several hundred feet in height, but more commonly bare, rounded hills that rise to successively higher eminences farther inland.

"There are two well-defined areas to which I would call attention; a simple designation of them as sea-coast and interior will present to you the general idea which I wish to convey. I will draw the line, as near as my own observation coincides with that of others, at somewhat between 2 and 4 miles inland. Of the interior of this whole region very little is known. In summer, woods of mostly low, stunted spruce, with various evergreens, are everywhere abundant, and it is with the utmost difficulty that one can make any progress whatever. Few have attempted to penetrate this area, and we know but little of it. Its accessible edges abound in many plants very similar to ours, especially those crowning the summits of the White mountains. That part styled the coast . . . is composed mostly of numerous low, hilly island crests, everywhere interspersed with narrow straits of water, besides a narrow ribbon of land up and down the coast-line itself. The general flora of all the islands is much the same, but there are localized species of both wild and introduced plants."³

Inland behind the range of hills is an elevated plateau with forested lake-shores, bogs, and tundra stretching on for unknown distances. The rivers flowing from the elevated plateau that forms the interior of northern Quebec form numerous spectacular cataracts and waterfalls of considerable size.

¹ Loc. cit., pp. 287, 288.

² Schuchert, Prof. Charles, letter, April 24, 1916.

³ Stearns, W. A., Proc. U.S. Nat. Mus., vi, 126 (1883).

Immediately behind Seven Islands (which is 300 miles east of Quebec) the hills rise to a height of 1,700 feet, and from this village to St. Jean river skirt the shore very closely. A few miles inland from here is St. Jean mountain, 1,416 feet high.

The coast-line along this stretch shows very little diversity, there being no deep bays and no islands of consequence.

From the mouth of St. Jean river eastward to Betchouane is a narrow coastal plain formed partly of sand-plain and partly of the nearly horizontal Silurian limestones that overlie the Archæan rocks in this region.

The Mingan islands are nearly all of similar formation. From a shingle beach or directly from the sea they rise in abrupt cliffs to 200 feet in height. The talus slopes and the gently rising slope extending back from the top of the cliff are well wooded. The summit of the island is usually open and boggy. The strata dip slightly to the south and west.

Eastward from here the Laurentian rocks are the country rock and the coast-line becomes more irregular with many indentations and small islands.

Natashkwan river, near its mouth, traverses a large sand-plain which to the east approaches the shore in the form of high sand bluffs.

From Kégashka eastward to the strait of Belle Isle the coast is bordered by a fringe of almost innumerable islands, of all sizes and shapes, that sometimes attain a height of 500 feet and that afford shelter in stormy weather. The flat tablelands into which the sedimentary rocks of the strait of Belle Isle are divided form a very different skyline.

CLIMATE

No reliable meteorological data are available from any point between the village of Clarke, in Arnaud township, and Amour point, a few miles east of Blanc-Sablon river, but these two points are approximately the west and east limits of the region, and data from them admirably show the differences in climate.

The eastern part of the coast has a longer growing season, although its temperature is much lower, but the vegetation is of a much more arctic type.

Clarke, Saguenay County, Quebec¹

1909							1910			
	Temperature			Rain	Snow	Fogs	Tempera- ture	Rain	Snow	Fogs
	Mean daily range	Maximum	Minimum							
	° F.			Amount in inches	Amount in inches	Number of days	Monthly mean ° F.	Amount in inches	Amount in inches	Number of days
January.....	24.3	41.0	-38.0	0.50	23.0	1	11.5	3.95	24.0	..
February.....	24.2	33.0	-33.0	0.00	49.5	.....	4.9	0.00	26.5	1
March.....	21.0	44.0	-22.0	0.40	19.0	.....	17.1	.....	29.0	..
April.....	22.0	53.0	7.0	0.20	14.5	.....	32.1	5.70	10.0	2
May.....	19.7	71.0	27.0	2.94	1.5	.....	42.7	2.08	.....	..
June.....	24.8	77.0	28.0	5.33	.....	.....	51.4	4.19	.....	..
July.....	18.1	78.0	44.0	6.87	.....	.....	60.2	4.57	.....	..
August.....	25.7	88.0	37.0	1.68	.....	.....	58.1	3.38	.....	1
September.....	15.7	69.0	31.0	10.15	.....	.....	47.9	1.68	.....	1
October.....	14.1	67.0	23.0	4.66	2.0	.....	37.9	4.31	2.0	2
November.....	14.8	48.0	0.0	4.64	23.5	.....	31.7	5.82	16.5	..
December.....	10.8	41.0	-11.0	0.90	26.3	3	10.3	0.00	31.0	..
Total.....	24.9	88.0	-38.0	38.27	159.3	4	33.8	35.68	139.0	7

¹ Dept. Marine and Fisheries, Ann. Rept.

Amour Point, Strait of Belle Isle¹

	1909				1910			
	Tempera- ture	Rain	Snow	Fogs	Tempera- ture	Rain	Snow	Fog
	Monthly mean	Amount in inches	Amount in inches	No. of days	Monthly mean	Amount in inches	Amount in inches	No. of days
	° F.				° F.			
January.....	4.9	0.10	25.0	.....	16.4	0.39	2.2	..
February.....	7.2	.....	17.2	.....	8.0	0.00	1.8	..
March.....	24.7	.....	9.2	.....	19.3	0.13	5.4	..
April.....	26.8	.....	1.1	2	32.2	1.51	11.0	6
May.....	37.3	1.24	.....	6	35.5	2.17	13.0	8
June.....	46.1	3.37	.....	7	43.3	4.33	.....	11
July.....	50.0	3.47	.....	19	48.0	2.41	.....	13
August.....	52.7	2.33	.....	9	54.0	1.85	.....	10
September.....	49.3	3.06	.....	6	47.8	0.57	.....	3
October.....	43.0	4.10	.....	8	36.3	2.23	.....	7
November.....	31.5	1.69	1.4	6	32.7	4.12	0.5	6
December.....	28.4	3.15	1.2	.....	18.2	.....	.....	..
Total.....	33.5	22.51	55.1	63	32.6	19.71	33.9	64

BOTANICAL EXPLORATIONS

Although early explorers may have carried to Europe plants from the north shore of the gulf of St. Lawrence, the earliest definite records known to the writer are those of John James Audubon, who, though an ornithologist on a quest for birds, noticed the plants, enthused over their beauty, and yearned for the knowledge that would give him a fuller understanding of them. Audubon and his party, which consisted of five young men—his son, John Woodhouse Audubon, Dr. George C. Shattuck, William Ingalls, Thomas Lincoln, and Joseph Coolidge—visited the north shore of the gulf in the schooner *Ripley*. On June 17, 1833, they reached American harbour, now called havre des Canadiens, Natashkwan. They cruised eastward from here, touching at Petit Mécatina, baie de Portage, and Brador. Having spent nearly two months on the coast they sailed from the strait of Belle Isle homeward bound on August 11, 1833. The party collected some botanical specimens, which seem to have been destroyed in one of the two fires that burned many of Audubon's possessions in later years. In his journal "Audubon and his Journals" (1897), published by Maria R. Audubon, there are several references to the native plants.

In 1833, the same year as that of Audubon's visit, the *Gulnare*, of the Royal Navy, under Capt. Bayfield, was making the survey on which all modern charts are based of the coast of the north shore of the gulf of St. Lawrence. From Audubon's journal it appears that he met with the *Gulnare* first at American harbour (Natashkwan) and later at several other points to the eastward. Audubon refers several times to the doctor on this vessel, "who appeared to be a man of talents, a student of botany

¹ Dept. Marine and Fisheries, Ann. Rept.

and conchology." And again he writes (page 392) "Dr. Wm. Kelly has given me the list of such plants as he has observed on the coast as far as Mécatina island." In 1886 Miss M. R. Audubon, while preparing for publication "Audubon and his Journals," found between the leaves of Audubon's original Labrador Journal a plant-list. It is on a large piece of folded paper, ruled in pencil and in ink. It contains the names of 147 species and has the heading "List of plants collected during the survey of the coast of Labrador between Mingan and Mécatina." Miss Audubon, thinking that the list was that of the plants collected by Audubon himself, gave it to Mr. Walter Deane, the present owner. Through his courtesy the author has been allowed to borrow and study the list and to quote from it. To one familiar with the details of Audubon's Labrador trip there are several discrepancies in this list. In the first place neither Audubon nor any of this party was making a "survey of the coast of Labrador between Mingan and Mécatina." Audubon reached the coast at Natashkwan, 90 miles east of Mingan, and his explorations continued to the strait of Belle Isle, 150 miles east of île Petit Mécatina. In the second place some of the species are marked as coming from Anticosti, which Audubon did not visit. A footnote about *Cornus suecica* states that it is first met with in St. Lawrence river at Brandypot islands, which are well up the river, near Rivière-du-Loup (Fraserville). Audubon and his party did not descend the St. Lawrence. When these facts are reviewed and the perfect agreement of the details noted, it is evident the list in question was compiled by Dr. Wm. Kelly and given by him to Audubon on July 9, 1833. His determinations were made with the aid of the floras by Pursh and Eaton. Some of the plants recorded were from outside the area considered here; some of the species recorded seem doubtful as natives of this region; others are in groups that have been confused and later segregated; and others are quite indeterminate. On the other hand, some very rare and local but unmistakable species were detected, thus giving an authenticity to the list. Such records as these have been incorporated in the annotated list of species, but all doubtful ones have been omitted.

There are two letters from Dr. Kelly preserved in Sir William Hooker's correspondence. In the first, written from Quebec, November 8, 1830, he speaks of sending a *Cornus* which he felt to be different from *Cornus canadensis*. This is without doubt the specimen of *Cornus suecica* L. which is preserved in the herbarium of the Royal Botanic Gardens, Kew, and which is cited by Hooker in his *Flora Boreali-Americana*, i, 277 (1840). The second letter, written from Quebec, May 10, 1833, mentions by number and, in certain cases, by generic name, eight plants that he was sending for identification. It is clear that he had previously studied them with Mr. Sheppard. The package containing these eight specimens seems to have been lost in transit. There is no record that Dr. Kelly made any more extensive plant collections during his trip on the *Gulnare*. The list given to Audubon seems to have been based principally on field observations.

From July 20 to September 25, 1849, Dr. Horatio R. Storer with his brother, F. H. Storer, and Dr. Jeffries Wyman, explored from Natashkwan to Red bay, Labrador. Dr. Storer collected numerous specimens of the

vascular plants, which are now in the Gray Herbarium. He is the only collector who has found the sea lavender, *Limonium trichogonum*, in Labrador. He published a report on the fishes of Labrador, but did not include even a casual mention of the plants. His intensely interesting journal contains only a few meagre references to plants.

Abbé J. B. A. Ferland in 1858 made a voyage along the north shore of the gulf from Mingan to Blanc-Sablon. The few plants of his collection came probably from Tabatière bay, some of them being now in the Gray Herbarium. His botanical observations were very restricted and of a very popular sort. In his little book, "Le Labrador," are a few notes upon the vegetation.

Dr. Henry Bryant, an ornithologist seeking to follow in Audubon's tracks, in 1860 coasted along the north shore of the gulf from Romaine river to Château bay, Labrador. He collected small specimens of various plants, now in the Gray Herbarium, but he did not publish any report upon them.

A. S. Packard was one of the seven members of the Williams College Expedition. The party was landed on Caribou island (île de la Demoiselle) July 7, 1860, and remained there in camp for fifty days. The commoner plants were observed and later were recorded in Chapters iv and v of Packard's "Labrador coast" (1891).

A party consisting of A. E. Verrill, Alpheus Hyatt, and N. S. Shaler were at Mingan islands early in July, 1861. All the members of the party aided in collecting plants, which was one of the secondary activities of the trip. Their collection, now in the Eaton Herbarium, Yale University, and a second fragmentary set in the Gray Herbarium, contains 48 species. A list based upon these collections was published by Verrill.¹

Rev. S. R. Butler spent several years previous to 1870 in southern Labrador and made extensive observations on the flora. His collection, made at Forteau bay and Amour point which are in Labrador, and at Caribou island (archipel du Vieux-Fort, île de la Demoiselle), is now in the Eaton Herbarium. His list has a total of 135 species of vascular plants.²

The most thorough botanical survey of any considerable part of the north shore was made by D. N. Saint-Cyr in two separate trips. In 1882, in a small steamer, he visited Seven Islands, exploring from there to Mingan islands, where he did a large amount of collecting and continued east as far as Watshishu.

In July, 1885, his second trip took him to those parts of the coast visited previously and eastward to île Gros Mécatina. Saint-Cyr's collection forms an important part of the *Herbier du Musée Scolaire, Département de l'Instruction Publique, Quebec*. The author visited this collection in Quebec, checked the plants in connexion with Saint-Cyr's published list, and with the kind permission of the officials in charge, borrowed such plants as needed critical study. Saint-Cyr reports about 227 species from this region.

In some cases collections made on Mingan islands, not included in Saint-Cyr's list, are in his following "Catalogue of plants" in the Museum. There is an occasional discrepancy between the same record as given in

¹ Proc. Boston Soc. Nat. Hist., ix, 146-52 (1862).

² Can. Nat., v, 350-3 (1870).

the two lists: sometimes the data on the specimens in the Musée Scolaire are quite different from those of the published records; and sometimes the specimen could not be found. In view of this confusion, the author has used his judgment in such cases as to what were the correct data, or as to what records were so untrustworthy as to warrant rejection.

John A. Allen visited Labrador in 1882, but as he published nothing about the trip, it has been difficult to glean any information regarding it. He seems to have sailed from Boston in the *Polar Star*, piloted by Owen Chevalier. Judging from the dates on Allen's specimens, he collected from July 26 to 31 at Bonne-Espérance and adjacent regions. Then he sailed eastward and northward. On his return trip he again collected near Bonne-Espérance on August 27-28. A nearly complete set of his plants is in the Gray Herbarium, and his own set is in the herbarium of the Connecticut Agricultural Experiment Station, New Haven. In a letter written to M. S. Bebb, now in the possession of Mr. Walter Deane, Allen says: "During the limited time that I was able to go ashore and collect, I was busy collecting everything I could get hold of and had no time to study the variations of the willows in the field, which I suppose would be the best way to do it. I have about 270 phænogams and vascular cryptogams from Labrador, exclusive of willows." The reference to the willows is explained by the fact that Allen sent all his specimens to Bebb for identification. At the Experiment Station, among Allen's correspondence is a series of letters from Bebb. On October 13, 1882, Bebb had just received these willows and in a letter to Allen brimming with enthusiasm wrote: "The truth is there is no spot on the whole American continent which presents a willow flora so full of interest and I may add at the same time so full of tantalizing intricacy as Labrador." In this same letter Bebb gives tentative names to some of them:

- 5. *Salix balsamifera* Barratt, f. *typica*
- 12. " " n. var.
- 3. *S. candida*
- 2. *S. arctica* forma
- 11, 12. *S. argyrocarpa*
- 24, 25. *S. viminalis*
- 23, 26. *S. alba* × *fragilis*

This is only a preliminary and partial list, but none of these species is among Allen's plants either in the Gray Herbarium or the Herbarium of the Experiment Station. Except for an interval caused by Bebb's illness, Allen and Bebb corresponded about these willows for several years. Finally Bebb sent most of them to Kew for comparison. Sir J. D. Hooker replied, "Prof. Oliver and Mr. Brown at the herbarium have spent four hours over the *Salices*, with I fear only negative results." Bebb alludes to these willows in a letter to Dr. Watson, dated August 6, 1885, now in the Gray Herbarium, saying, "Three years ago or more Mr. Allen made a splendid collection of *Salices* in Labrador and on an average at least once a year since then I have tackled that lot and tried to do something with it—the result being mainly negative every time."

Allen's Labrador willows with Prof. Oliver's annotations remained for some time in Bebb's herbarium, and both ultimately went to the Field Museum, Chicago, where they now are. The writer has incorporated the records in this report.

Allen called on other specialists for help in the identification of his plants. William Boott named all his *Carices*. Engelmann named several of his species of *Juncus*. Sereno Watson identified for him a score of miscellaneous species. Allen's plants were well prepared, and well identified, and they form one of the most important collections from the region.

"W. A. Stearns spent two summers, and one whole year in Labrador and the north shore of the gulf of St. Lawrence. The two summer months of 1875 were spent within a radius of 60 miles southwest and 10 miles northeast of Bonne-Espérance. He stayed from September, 1880, to September, 1881, at Bonne-Espérance and explored the coast from Mingan to Red bay; in July and August, 1885, he again visited the Labrador coast, sailing from Boston in a sloop. He touched at various points between Bonne-Espérance and Triangle harbour a few miles south of Hamilton inlet."¹ His specimens of plants are in the U.S. National Herbarium and were in part seen by the author. His list includes 157 species.

William Palmer in 1887 visited the north shore of the gulf and made a small collection of plants now in the U.S. National Herbarium. The data on one of his plants are evidence that he visited the mouth of Mingan river.

Dr. C. B. Robinson spent the summer of 1907 along the north shore of the gulf, with Seven Islands as a centre. He collected several hundred species of plants now in the herbarium of the New York Botanical Garden, with a duplicate set in the Gray Herbarium, but never published any extended account of them, nor did he leave any manuscript list.

Dr. C. W. Townsend made two trips to the north shore as well as the one elaborated in this report. On May 24, 1909, he arrived with A. C. Bent at Seven Islands bay and spent a month in cruising in a "barge" east to Natashkwan. The plants collected are now in the Gray Herbarium.

In 1912 with E. G. Parrot, he canoed up Natashkwan river for 80 miles. Although many of the plants were not collected in the coastal region they are included in this list. Of special interest is the rediscovery of *Salix adenophylla* Hook. The plants are now in the Gray Herbarium.

Prof. M. L. Fernald spent five days at Blanc-Sablon in early August, 1910, and explored as far west as Brador bay. He collected 237 species, now in the Gray Herbarium. He describes the region and its flora and mentions 81 species.²

Prof. K. M. Wiegand visited Blanc-Sablon in September of the same year. He was working in conjunction with Prof. Fernald and his collections are included in the total given above.

Harold St. John made his botanical collections, which are the basis of this report, during the three summer months of 1915. With the ornithologist, Dr. C. W. Townsend, he coasted in a steamer from Seven Islands bay to Pointe-aux-Esquimaux and thence in a small schooner to Blanc-Sablon and afterwards returned to Mingan. The botanical results are tabulated as follows:

Number of species collected.....	511
Number of sheets collected.....	2,174
Number of notes on the distribution of various species..	3,239

¹ Townsend, C. W., and Allen, G. M., Proc. Boston Soc. Nat. Hist., xxxiii, 292 (1907).

² Rhodora, xiii, 109-162 (1911).

The first set of specimens is in the herbarium of the Geological Survey, Canada, the second in the Gray Herbarium. The geographic names on the printed labels were those of the Rinfret map.

PHYTOGEOGRAPHY

A botanist visiting the north shore of the gulf of St. Lawrence cannot help being struck by the definite and local occurrence of many of the species of plants, and if he accumulate specimens and accurate notes on their distribution, he will arrive at some very definite correlations. These are especially obvious because, although the whole region seems to have been thoroughly glaciated, striæ and lunoid furrows being frequently met with, yet glacial drift is conspicuously wanting, except above an altitude varying from 250 to 1,000 feet, when glacial deposits in the form of huge erratics are suddenly met with on every side.

"The remarkable absence of erratics in the Moisie, until an altitude of about 1,000 feet above the sea is attained, may be explained by the supposition that they may have been carried away by icebergs and coast ice during a period of submergence to the extent of about 1,000 feet."¹

As a consequence of the washing off of all loose particles, the soil at the lower levels has been recently formed in situ and hence does not differ fundamentally in its chemical content from that of the country rock. This affords clear and neatly delimited conditions for the study of the correlations between the nature of the soil and the distribution of the plants. In reference to one portion of this area Prof. Fernald wrote: "Here was an ideal place to study the vegetation of a highly calcareous region side by side with the plants of a siliceous and gneissoid area, and if anyone doubts the dissimilarities of these floras he can find no better spot in which to undeceive himself than at Blanc-Sablon."²

EXTENT OF THE VASCULAR FLORA

The annotated list of flora shows 622 species, of which 40 are weeds or introduced plants, rank intruders that demand the attention of the botanist but often fail to interest him. This small total of adventive plants is an indication of the amount of settlement in the region. Each little fishing village has a few weeds, but they are obviously newcomers. In no case has the weed spread to any extent beyond the limits of the settlement, and in no case is it difficult to decide whether the plant is a native of the region. In Dr. Wm. Kelly's manuscript list made in 1833, the earliest plant record, only one of these 40 species of weeds—*Vicia Cracca*—is mentioned. Omitting the weed element a flora of 582 species of native vascular plants remains.

¹ Hind, H. Y., Can. Nat., 2nd ser., i, 302 (1864).

For further evidence on the postglacial submergence of the coast of Labrador, and the absence of drift on the lower levels, see Daly, R. A., "The geology of the northeast coast of Labrador," Bull. Mus. Comp. Zool., Harvard Univ., xxxviii, geol. ser., v, 205-70 (1902).

² Fernald, M. L., Rhodora, xiii, 122 (1911).

HALOPHYTES

Within reach of the influence of salt water, whether the shore be marshy, sandy, or rocky, is a characteristic assemblage of plants commonly known as halophytes,¹ because they grow where salt water is the governing factor. On a stretch of coast of this length the greater number of these plants are as certain to be present throughout its extent as is salt water itself. They are plants of broad ranges, and within this comparatively restricted area present few difficult problems. The total number known to occur on this coast is 66, partly true halophytes of the salt marshes, partly psammophilous halophytes of the seashore sands and gravels, and partly plants (probably not truly halophytic) of broad inland range on the North American continent, but in Saguenay county strictly maritime: The components of this flora are enumerated below:

LIST OF HALOPHYTES

<i>Ruppia maritima</i> , var. <i>rostrata</i>	<i>C. maritima</i>
<i>R. maritima</i> , var. <i>subcapitata</i>	<i>C. salina</i> , var. <i>lanceata</i>
<i>Zostera marina</i>	<i>C. subspathacea</i>
<i>Z. marina</i> , var. <i>angustifolia</i>	<i>Spergularia canadensis</i>
<i>Spartina alterniflora</i>	<i>Stellaria humifusa</i>
<i>Puccinellia paupercula</i>	<i>Potentilla pacifica</i>
<i>P. paupercula</i> , var. <i>alaskana</i>	<i>Hippuris vulgaris</i> , var. <i>maritima</i>
<i>P. coarctata</i>	<i>Limonium trichogonum</i>
<i>Scirpus rufus</i> (not seen by the writer, but halophytic in other regions about the gulf of St. Lawrence.)	<i>Glaux maritima</i> , var. <i>obtusifolia</i>
<i>Carex glareosa</i> , var. <i>amphigena</i>	<i>Lomatogonium rotatum</i> , forma <i>americanum</i>
<i>C. norvegica</i>	<i>Plantago decipiens</i>
	<i>Galium trifidum</i> , var. <i>halophilum</i>

LIST OF PSAMMOPHILOUS HALOPHYTES

<i>Ammophila breviligulata</i>	<i>C. tridactylites</i>
<i>Poa eminens</i>	<i>Lathyrus maritimus</i>
<i>Hordeum boreale</i>	<i>Ligusticum scoticum</i>
<i>Polygonum Fowleri</i>	<i>Cælopleurum lucidum</i>
<i>Salsola Kali</i>	<i>Euphrasia purpurea</i>
<i>Arenaria peploides</i>	<i>E. purpurea</i> , var. <i>Farlowii</i>
<i>A. peploides</i> , var. <i>diffusa</i>	<i>E. purpurea</i> , var. <i>Randii</i>
<i>A. peploides</i> , var. <i>robusta</i>	<i>Mertensia maritima</i>
<i>Montia lamprosperma</i>	<i>Senecio palustris</i>
<i>Cakile edentula</i>	<i>S. Pseudo-Arnica</i>
<i>Cochlearia cyclocarpa</i>	

PLANTS HALOPHYTIC ALONG THE SOUTH SHORE OF SAGUENAY COUNTY, BUT BROADLY DISTRIBUTED ACROSS THE INTERIOR OF NORTH AMERICA

<i>Potamogeton perfoliatus</i> , var. <i>gracilis</i>	<i>Juncus balticus</i> , var. <i>littoralis</i>
<i>P. pectinatus</i>	<i>Rumex occidentalis</i>
<i>Zannickellia palustris</i>	<i>R. mexicanus</i>
<i>Triglochin palustris</i>	<i>Atriplex patula</i>
<i>T. maritima</i>	<i>A. patula</i> , var. <i>hastata</i>
<i>Hierochloë odorata</i> , var. <i>fragrans</i>	<i>Stellaria crassifolia</i>
<i>Agrostis alba</i> , var. <i>maritima</i>	<i>Ranunculus Cymbalaria</i>
<i>Catabrosa aquatica</i>	<i>Sedum roseum</i>
<i>Elymus arenarius</i> , var. <i>villosus</i>	<i>Potentilla Anserina</i>
<i>Eleocharis palustris</i> , var. <i>glaucescens</i>	<i>P. Anserina</i> , var. <i>sericea</i>
<i>Scirpus americanus</i>	<i>Lathyrus palustris</i> , var. <i>pilosus</i>

¹ Greek: *halos*, salt; *phyton*, a plant.

OXYLOPHYTES

Since the Archæan rocks which occupy such a large part of Saguenay county form on disintegration an acid soil, the region is clothed with a typical oxylophytic vegetation. As early as 1830 it was pointed out that "the heaths are found most luxuriantly where granite or other primitive rocks are found,"¹ but in the light of recent field work the "other primitive rocks" should not include those which supply abundant available lime to the soil. This principle is well illustrated in the area visited, the Ericaceæ being represented by 28 species which form a very large part of the vegetation. The oxylophytes form the largest element in the flora, numbering 166 species, many of which are strictly confined to the acid areas, the others being best developed in acid soils, but apparently tolerant of a slight amount of lime. In several limestone regions, plants ordinarily confined to acid areas were found growing on the boggy or peaty crests of limestones. Their presence there is easily accounted for by the ready solubility of the lime, which, by leaching, was early removed from the crests, which, although limestone, are no longer calcareous. The following list enumerates the plants of the region which are characteristic of acid, non-calcareous soils. Those not quite constant in their habitat are marked "(indifferent)."

LIST OF TYPICAL OXYLOPHYTES

<i>Woodsia ilvensis</i> (indifferent)	<i>E. gracile</i>
<i>Pteridium latiusculum</i>	<i>E. tenellum</i>
<i>Osmunda Claytoniana</i> (indifferent)	<i>E. angustifolium</i>
<i>O. cinnamomea</i>	<i>E. angustifolium</i> , var. <i>majus</i>
<i>Lycopodium Selago</i>	<i>E. virginicum</i>
<i>L. Selago</i> , var. <i>appressum</i>	<i>Rhynchospora alba</i>
<i>L. Selago</i> , var. <i>palens</i>	<i>Carex ænea</i>
<i>L. annotinum</i>	<i>C. exilis</i>
<i>L. annotinum</i> , var. <i>pungens</i>	<i>C. echinata</i>
<i>L. clavatum</i>	<i>C. echinata</i> , var. <i>angustata</i>
<i>L. clavatum</i> , var. <i>monostachyon</i>	<i>C. canescens</i> , var. <i>subloliacea</i>
<i>L. clavatum</i> , var. <i>megastachyon</i>	<i>C. canescens</i> , var. <i>disjuncta</i>
<i>L. obscurum</i>	<i>C. brunnescens</i>
<i>L. sitchense</i>	<i>C. tenuiflora</i> (indifferent)
<i>L. complanatum</i>	<i>C. trisperma</i>
<i>L. complanatum</i> , var. <i>flabelliforme</i>	<i>C. tenella</i> (indifferent)
<i>Selaginella rupestris</i> (indifferent)	<i>C. chordorrhiza</i>
<i>Pinus Banksiana</i>	<i>C. rigida</i>
<i>Picea mariana</i>	<i>C. lenticularis</i>
<i>Sparganium hyperboreum</i>	<i>C. pauciflora</i>
<i>Scheuchzeria palustris</i>	<i>C. stylosa</i>
<i>Hierochloë alpina</i>	<i>C. umbellata</i> , var. <i>brevirostris</i>
<i>Agrostis borealis</i>	<i>C. deflexa</i> (indifferent)
<i>Deschampsia flexuosa</i>	<i>C. livida</i> (indifferent)
<i>D. atropurpurea</i>	<i>C. pauperula</i>
<i>Glyceria canadensis</i>	<i>C. limosa</i>
<i>G. Fernaldii</i> (indifferent)	<i>C. rariflora</i>
<i>Eleocharis acicularis</i>	<i>C. oligosperma</i>
<i>Scirpus cæspitosus</i>	<i>C. saxatilis</i> , var. <i>rhomalea</i>
<i>S. atrocinctus</i>	<i>Calla palustris</i>
<i>Eriophorum Chamissonis</i> (indifferent)	<i>Eriocaulon septangulare</i>
<i>E. callitrix</i>	<i>Juncus bufonius</i> (indifferent)

¹ Thomson, William, Loudon's Mag. Nat. Hist., iii, 417 (1830).

LIST OF TYPICAL OXYLOPHYTES—*Continued*

<i>J. trifidus</i>	<i>E. atropurpureum</i>
<i>J. Vaseyi</i>	<i>E. Eamsii</i>
<i>J. filiformis</i>	<i>Nemopanthus mucronata</i>
<i>J. brevicaudatus</i>	<i>Hypericum boreale</i>
<i>J. pelocarpus</i>	<i>Viola pallens</i>
<i>J. subtilis</i> (indifferent)	<i>Viola adunca</i>
<i>Luzula confusa</i>	<i>Epilobium palustre</i>
<i>L. spicata</i>	<i>E. palustre</i> , var. <i>monticola</i>
<i>L. campestris</i> , var. <i>multiflora</i>	<i>E. palustre</i> , var. <i>longirameum</i>
<i>Clintonia borealis</i> (indifferent)	<i>Circæa alpina</i>
<i>Smilacina trifolia</i>	<i>Aralia hispida</i>
<i>Maianthemum canadense</i> (indifferent)	<i>Cicuta bulbifera</i>
<i>Cypripedium acaule</i>	<i>Cornus suecica</i> (indifferent)
<i>Habenaria obtusata</i>	<i>Moneses uniflora</i>
<i>Epipactis repens</i> , var. <i>ophioides</i>	<i>Monotropa uniflora</i>
<i>Listera cordata</i>	<i>Ledum grænländicum</i>
<i>Salix argyrocarpa</i>	<i>Rhododendron canadense</i>
<i>S. humilis</i>	<i>Loiseleuria procumbens</i>
<i>S. phyllifolia</i>	<i>Kalmia angustifolia</i>
<i>S. pyrifolia</i>	<i>K. polifolia</i>
<i>S. Uva-ursi</i>	<i>Andromeda glaucophylla</i>
<i>Populus tremuloides</i>	<i>Chamædaphne calyculata</i>
<i>Comandra livida</i> (indifferent)	<i>Arctostaphylos alpina</i> (indifferent)
<i>Rumex Acetosella</i> (indifferent)	<i>Chiogenes hispidula</i>
<i>Polygonum arifolium</i>	<i>Vaccinium canadense</i>
<i>Arenaria grænländica</i>	<i>V. pennsylvanicum</i>
<i>Silene acaulis</i> , var. <i>exscapa</i>	<i>V. pennsylvanicum</i> , var. <i>myrtilloides</i>
<i>Lychnis alpina</i>	<i>V. pennsylvanicum</i> , var. <i>angustifolium</i>
<i>Nymphoanthus variegatus</i> (indifferent)	<i>V. uliginosum</i>
<i>Ranunculus hyperboreus</i>	<i>V. Vitis-Idæa</i> , var. <i>minus</i>
<i>Coptis trifolia</i>	<i>V. Oxycoccus</i>
<i>Subularia aquatica</i>	<i>Diapensia lapponica</i>
<i>Sarracenia purpurea</i>	<i>Lysimachia terrestris</i>
<i>Drosera rotundifolia</i>	<i>Trientalis borealis</i>
<i>D. anglica</i>	<i>Menyanthes trifoliata</i>
<i>D. longifolia</i>	<i>Lycopus uniflorus</i>
<i>Sedum villosum</i>	<i>Veronica scutellata</i>
<i>Ribes hirtellum</i> (indifferent)	<i>Melampyrum lineare</i>
<i>Spiræa latifolia</i>	<i>Utricularia minor</i>
<i>Pyrus arbutifolia</i> , var. <i>atropurpurea</i>	<i>U. cornuta</i>
<i>Potentilla palustris</i>	<i>Galium Claytoni</i>
<i>P. palustris</i> , f. <i>subsericea</i>	<i>Diervilla Lonicera</i>
<i>P. palustris</i> , var. <i>parvifolia</i>	<i>Lonicera cærulea</i> , var. <i>villosa</i>
<i>P. tridentata</i> (indifferent)	<i>L. cærulea</i> , var. <i>calvescens</i>
<i>Rubus Chamæmoros</i>	<i>Viburnum cassinoides</i>
<i>Sanguisorba canadensis</i>	<i>Lobelia Dortmanna</i>
<i>S. canadensis</i> , var. <i>latifolia</i>	<i>Solidago macrophylla</i> , var. <i>thyrsoides</i>
<i>Prunus pennsylvanica</i>	<i>S. graminifolia</i>
<i>Oxalis Montana</i>	<i>Aster radula</i> , var. <i>strictus</i>
<i>Empetrum nigrum</i>	<i>Gnaphalium uliginosum</i>

CALCICOLES

The annotated lists in this report frequently contain the phrase, "known only from the calcareous region of Mingan islands and the strait of Belle Isle." The correlation between the presence of certain plants and soils rich in calcium is well known and has often been pointed out,¹ but in the area studied this affinity is particularly striking.

Little is known of the flora of Manowin island, which has calcareous, fossil-bearing rocks, but there is no reason to suppose it will prove an exception to the rule.

Vegetation in the vicinity of Mingan islands differs considerably from that on the Laurentian areas to the west. On every side are plants not seen in the Laurentian area. At the top of the white shingle beach of the islands is a riot of such plants as *Potentilla fruticosa*, *Shepherdia canadensis*, *Salix vestita*, and a dozen others which are seemingly fighting for supremacy. Beyond this thicket, in the woods that clothe the steep banks of the islands, are *Rhamnus alnifolia*, *Viola nephrophylla*, and *Pyrola asarifolia*, var. *incarnata*. The wet, dripping cliffs support *Dryas integrifolia*, *Cryptogramma Stelleri*, *Orchis rotundifolia*, *Calypso bulbosa*, *Tofieldia minima*, and festoons of *Saxifraga oppositifolia*. In a bog at the summit will be found *Salix candida* and *Scirpus hudsonianus*.

East of Mingan islands are many gravel beaches and wooded hillsides, and steep wet cliffs comparable with those of Mingan islands, but they are not clothed with the same plants. These, indeed, do not occur nearer than Bradore bay, where great, flat tablelands, quite different from the white limestones of Mingan islands, are formed of coarse, limy sandstones and pure limestone. Along the meadowy brooksides are once more found *Salix candida*, *S. vestita*, *Scirpus hudsonianus*, and on the slopes of the tablelands *Cryptogramma Stelleri*, and *Potentilla fruticosa*.

Mingan islands and Bradore bay are 300 miles apart and Bradore bay has by far the colder climate, but they have 25 typical calcicoles in common. Each of these areas has other plants in common, bringing the total up to 83 species. The following list enumerates the species restricted to the limestones or which find their greatest development thereon, in the latter case being marked "(indifferent)".

LIST OF REPRESENTATIVE CALCICOLES

<i>Woodsia alpina</i>	<i>Poa alpina</i>
<i>Thelypteris fragrans</i>	<i>P. alpina</i> , var. <i>Bivonæ</i>
<i>T. Robertiana</i>	<i>Glyceria nervata</i> , var. <i>stricta</i>
<i>Asplenium viride</i>	<i>Scirpus hudsonianus</i>
<i>Cryptogramma Stelleri</i>	<i>Carex gynocrates</i>
<i>Botrychium Lunaria</i>	<i>C. aurea</i>
<i>Equisetum scirpoides</i>	<i>C. Halleri</i>
<i>Selaginella selaginoides</i>	<i>C. atrata</i> , var. <i>ovata</i>
<i>Potamogeton filiformis</i> , var. <i>borealis</i> (indifferent)	<i>C. vaginata</i> (indifferent)
<i>Milium effusum</i>	<i>C. eburnea</i>
<i>Muhlenbergia racemosa</i> (indifferent)	<i>C. concinna</i>
<i>Phleum alpinum</i> (indifferent)	<i>C. flava</i> (indifferent)
<i>Trisetum spicatum</i> , var. <i>pilosiglume</i>	<i>C. flava</i> , var. <i>elatior</i>
	<i>C. Oederi</i> , var. <i>pumila</i> (indifferent)

¹ "The presence or absence of lime is the most important particular in which petrology affects the distribution of plants": Praeger, R. L., "Irish topographical botany," xxvii (1901).

LIST OF REPRESENTATIVE CALCICOLES—*Continued*

<i>C. capillaris</i> (indifferent)	<i>Potentilla pectinata</i>
<i>C. capillaris</i> , var. <i>elongata</i>	<i>P. fruticosa</i>
<i>Juncus triglumis</i>	<i>Geum macrophyllum</i>
<i>Luzula parviflora</i> , var. <i>melanocarpa</i>	<i>G. rivale</i>
<i>Tofieldia minima</i>	<i>Dryas integrifolia</i>
<i>T. glutinosa</i>	<i>Alchemilla vulgaris</i> , var. <i>filicaulis</i>
<i>Zigadenus chloranthus</i>	<i>Rhamnus alnifolia</i>
<i>Cypripedium parviflorum</i>	<i>Viola nephrophylla</i>
<i>Orchis rotundifolia</i>	<i>Shepherdia canadensis</i>
<i>Microstylis monophyllos</i>	<i>Epilobium latifolium</i>
<i>Calypso bulbosa</i>	<i>Myriophyllum exalbescent</i>
<i>Salix candida</i>	<i>Pyrola minor</i> (indifferent)
<i>S. vestita</i>	<i>P. secunda</i> , var. <i>obtusata</i>
<i>S. vestita</i> , var. <i>psilophylla</i>	<i>P. asarifolia</i>
<i>Ranunculus abortivus</i>	<i>P. asarifolia</i> , var. <i>incarnata</i>
<i>Thalictrum confine</i>	<i>Arctostaphylos Uva-ursi</i>
<i>Anemone canadensis</i>	<i>A. Uva-ursi</i> , var. <i>coactilis</i>
<i>Caltha palustris</i>	<i>A. Uva-ursi</i> , var. <i>adenotricha</i>
<i>Draba megasperma</i>	<i>A. rubra</i>
<i>Erysimum asperum</i>	<i>Androsace septentrionalis</i>
<i>Arabis alpina</i>	<i>A. septentrionalis</i> , var. <i>robusta</i>
<i>A. Drummondii</i>	<i>Gentiana nesophila</i>
<i>Saxifraga aizoides</i>	<i>G. Amarella</i>
<i>S. Aizoon</i>	<i>Pinguicula vulgaris</i> (indifferent)
<i>S. oppositifolia</i>	<i>Solidago hispida</i>
<i>Parnassia parviflora</i>	<i>Senecio pauciflorus</i>
<i>P. Kotzebuei</i>	<i>Taraxacum ceratophorum</i>
<i>Ribes hirtellum</i> , var. <i>calcicola</i>	
<i>Fragaria virginiana</i> , var. <i>terræ-novæ</i> (indifferent)	

PLANTS INDIFFERENT TO THE CHEMICAL NATURE OF THEIR HABITATS

Certain species of plants—108 in number—are met with on all, or nearly all, the various types of soil or habitat in the region, and seem to grow with equal readiness on granitic or calcareous soils, or sometimes in brackish habitats. The weeds are evidently either indifferent or nearly indifferent to the nature of their habitat. It is easy to see how such adaptability helps to make them successful weeds.

LIST OF REPRESENTATIVE INDIFFERENT PLANTS

<i>Cystopteris fragilis</i>	<i>J. horizontalis</i>
<i>Thelypteris spinulosa</i>	<i>Sparganium angustifolium</i>
<i>T. Phegopteris</i>	<i>Potamogeton epihydrus</i>
<i>T. Dryopteris</i>	<i>P. pusillus</i>
<i>Athyrium angustum</i> , var. <i>rubellum</i>	<i>Phleum pratense</i>
<i>Equisetum arvense</i>	<i>Agrostis hyemalis</i> , var. <i>geminata</i>
<i>E. sylvaticum</i> , var. <i>pauciramosum</i> , f. <i>multi-ramosum</i>	<i>Calamagrostis canadensis</i>
<i>E. palustre</i>	<i>C. Langsdorffii</i>
<i>E. limosum</i>	<i>C. neglecta</i>
<i>Taxus canadensis</i>	<i>Cinna latifolia</i>
<i>Larix laricina</i>	<i>Trisetum spicatum</i> , var. <i>Maidenii</i>
<i>Picea canadensis</i>	<i>Poa nemoralis</i>
<i>Abies balsamea</i>	<i>P. palustris</i>
<i>Juniperus communis</i> , var. <i>montana</i>	<i>Glyceria nervata</i>
	<i>Festuca rubra</i>
	<i>Agropyron caninum</i> , var. <i>Hornemannii</i>

LIST OF REPRESENTATIVE INDIFFERENT PLANTS—*Continued*

<i>Scirpus rubrotinctus</i>	<i>Sedum roseum</i>
<i>Carex aquatilis</i>	<i>Saxifraga cespitosa</i>
<i>Luzula parviflora</i>	<i>Mitella nuda</i>
<i>L. campestris</i> , var. <i>frigida</i>	<i>Ribes prostratum</i>
<i>Smilacina stellata</i>	<i>Pyrus americana</i>
<i>Streptopus amplexifolius</i>	<i>Amelanchier Bartramiana</i>
<i>S. roseus</i>	<i>Potentilla monspeliensis</i>
<i>Iris versicolor</i>	<i>P. monspeliensis</i> , var. <i>norvegica</i>
<i>I. setosa</i> , var. <i>canadensis</i>	<i>Rubus arcticus</i>
<i>Sisyrinchium angustifolium</i>	<i>R. arcticus</i> , var. <i>grandiflorus</i>
<i>Habenaria dilatata</i>	<i>R. pubescens</i>
<i>Spiranthes Romanzoffiana</i>	<i>Trifolium repens</i>
<i>Salix lucida</i>	<i>Vicia Cracca</i>
<i>S. lucida</i> , var. <i>intonsa</i>	<i>Callitriche palustris</i>
<i>S. pellita</i>	<i>Viola incognita</i>
<i>Betula pumila</i>	<i>Epilobium angustifolium</i>
<i>Alnus crispa</i> , var. <i>mollis</i>	<i>E. alpinum</i>
<i>A. incana</i> , var. <i>glauca</i>	<i>Hippuris vulgaris</i>
<i>Urtica Lyallii</i>	<i>Aralia nudicaulis</i>
<i>Rumex Britannica</i>	<i>Heracleum lanatum</i>
<i>Polygonum viviparum</i>	<i>Conioselinum chinense</i>
<i>Sagina procumbens</i>	<i>Cornus canadensis</i>
<i>S. nodosa</i>	<i>C. stolonifera</i>
<i>Arenaria lateriflora</i> , var. <i>typica</i>	<i>Primula farinosa</i> , var. <i>macropoda</i>
<i>A. litorea</i>	<i>P. farinosa</i> , var. <i>incana</i>
<i>Stellaria borealis</i> , var. <i>isophylla</i>	<i>Halenia deflexa</i>
<i>S. longipes</i>	<i>Galeopsis Tetrahit</i> , var. <i>bifida</i>
<i>S. media</i>	<i>Rhinanthus Kyrollæ</i>
<i>Cerastium arvense</i>	<i>Utricularia vulgaris</i> , var. <i>americana</i>
<i>Ranunculus acris</i>	<i>Galium labradoricum</i>
<i>Thalictrum polygamum</i>	<i>Linnæa borealis</i> , var. <i>americana</i>
<i>Actæa rubra</i>	<i>Viburnum pauciflorum</i>
<i>Draba incana</i>	<i>Campanula rotundifolia</i>
<i>D. incana</i> , var. <i>confusa</i>	<i>Solidago macrophylla</i>
<i>D. arabisans</i>	<i>S. humilis</i>
<i>D. arabisans</i> , var. <i>orthocarpa</i>	<i>Aster foliaceus</i>
<i>Thlaspi arvense</i>	<i>A. umbellatus</i>
<i>Capsella Bursa-pastoris</i>	<i>Taraxacum officinale</i>
<i>Barbarea orthoceras</i>	

COMPARATIVE NOTES AS TO SOIL PREFERENCES OF CERTAIN PLANTS

More than sixty years ago, De Candolle¹ pointed out that the data regarding vegetation on the soils of one country should be compared with similar data in other countries.

As 50 per cent of the species known along the north shore of the gulf of St. Lawrence have a circumpolar distribution, occurring also in northern Europe, the Alps, or northern Asia, this flora seems a very appropriate one to use in just such a comparison as is suggested by De Candolle. In order to do this the ninety-eight articles or books listed were perused. Most of them, as will be seen, are by European workers. It was felt that data

¹ De Candolle, Alphonse, "Géographie Bot. Raisonnée", i, 428 (1855).

observed upon the same plants at a far distant part of their range would be more instructive than a mass of it gathered at other points near at hand. Consequently no effort was made to find and include the much less numerous American and Canadian works. Any statements in these publications regarding the habitats of any of the plants in the flora now under consideration, were noted, with due caution concerning difficult groups where there might be a confusion of identities. Striking out the species of which the soil preferences were imperfectly known along the coast of Saguenay county, and those concerning which only a few published notes were found, there remained 103 species, which are listed below. Under each is a statement of its habitat in the region here considered, and then the notes culled from published works. These notes are often translated into equivalent English scientific terms, but always, it is believed, with justice to the author quoted. After each of these notes is given a number which refers to the "List of Phytogeographical Articles," (page 38). After this number is given, in roman numerals, the number of the volume (if necessary) and the page.

The various authors, from whom these notes have been drawn, have often used very different terms which are nearly or exactly equivalent in meaning. To make their significance quite clear, they are arranged in the condensed glossary below.

GLOSSARY OF SPECIAL PHYTOGEOGRAPHICAL TERMS

Calcareous, having the qualities of, or containing lime.

Calcicole, growing upon limestone, or a calcareous soil; also a plant growing upon a calcareous soil.

Calcifuge, shunning lime.

Calciphile, lime-loving. In usage is equivalent to calcicolous or calcicole.

Chasmophyte, a plant that grows in rock crevices.

Halophilous, growing only within the influence of salt water.

Halophyte, a plant growing only within the influence of salt water.

Hydrophilous, water-loving; applied to plants which grow in or near the water.

Hydrophyte, a water-plant.

Hygrophilous, moisture-loving.

Hygrophyte, a marsh-plant.

Indifferent, used to designate plants which grow equally well on all or nearly all types of soil. When used to modify another term, as *indifferent calcicole*, it signifies that the plant usually but not always grows on a calcareous soil.

Lithophyte, a plant growing upon the surface of a rock, as some lichens. By some authors used to designate chasmophytes or plants which grow among rocks or on a rocky soil.

Oxylophyte, a plant growing only in sour or acid soils.

Pelophilous, clay-loving; growing on clay.

Psammophilous, sand-loving; growing on sand.

Psammophyte, a plant growing only upon sands.

Ruderal, growing in waste places, or among rubbish.

Siliceous, consisting of or abounding in silica.

Silicole, a plant growing only on highly siliceous soil.

Silicolous, growing upon siliceous soils.

CERTAIN SPECIES WITH A COMPARISON OF THEIR HABITATS
ALONG THE NORTH SHORE OF THE GULF OF ST.
LAWRENCE AND IN OTHER REGIONS,
ESPECIALLY EUROPE

Cystopteris fragilis (L.) Bernh.

On shaded rocks, ind.¹; lithophyte, ind., 15 ii, p. 299; silicolous hydrophyte, 51 ii, p. 79; ind. hydrophyte, 51 ix, p. 353; on limestone, 36 p. 170; on limestone, 29 p. 158.

Thelypteris spinulosa (O. F. Muell.) Nieuwl.

Ind.; ind., 15 ii, p. 299; silicolous, 51 ii, p. 74 and ix, p. 351; ind., 34 p. 126; on clay poor in lime, 85 p. 82.

T. Phegopteris (L.) Slosson.

Ind.; ind., a little hygrophilous, 15 ii, p. 299; ind. calcifuge, 47 p. xlii; silicolous, 65 p. 227; on damp siliceous soils, 85 p. 129; silicolous, 51 ii, p. 74 and ix, p. 344; silicolous, 65 p. 227; silicolous, 60 p. 113.

T. Dryopteris (L.) Slosson.

Ind.; on Scotch pine heath, 85 p. 119; on damp siliceous soils, 85 p. 129; silicolous 51 ii, p. 74 and ix, p. 345; on granite mountains 60 p. 113; ind., slightly hygrophilous, 15 ii, p. 299; on limestone, 36 p. 170; calcifuge, 48 p. 254; silicolous, 73 p. 84.

T. Robertiana (Hoffm.) Christensen.

Calcicole; calcicole, 85 p. 153; on chalk grassland, 85 p. 178; calciphile, 30 p. 230; calciphile, 29 p. 158; calciphile, 48 p. 254.

Asplenium viride L.

Calcicole; confined to calcareous soils, 15 xx, p. 275 and ii, p. 292; calciphile, 36 p. 170; calciphile, 73 p. 84; calciphile, 9 p. 209; on limestone or granite, 65 p. 226; calcicole, 85 p. 161; calciphile, 90 p. 273; calciphile, 30 p. 230; calciphile, 10 p. 328; calciphile, 80 p. 411; calciphile, 29 p. 158.

Botrychium Lunaria L.

Calcicole; ind., somewhat zerophytic, 15 ii, p. 299; silicolous, 51 ii, p. 74 and ix, p. 334; calciphile, 1 p. 523; ind., 34 p. 126; ind., 65 p. 226.

Equisetum arvense L.

Ind.; ind., usually on clay, 15 ii, p. 299; on clay, 90 p. 161; hydrophyte, ind., 51 ix, p. 307; ind., 34 p. 126; ind., 65 p. 225; psammophyte, 83 p. 118; calciphile, 10 p. 327.

E. sylvaticum L.

Ind.; ind. calcifuge, 15 ii, p. 301; on damp siliceous soils, 85 p. 129; hydrophytic silicole, 51 ii, p. 79; hydrophyte, ind., 51 ix, p. 308; silicolous, 65 p. 225.

E. palustre L.

Ind.; ind. calcifuge, hydrophyte, 15 ii, p. 301; on wet clay poor in lime, 85 p. 87; ind. hydrophyte, 51 ix, p. 310; ind. hydrophyte, 65 p. 225; oxylophyte, on low moor rich in Ca and K, but acid, 96 p. 197; ind., 34 p. 126; hydrophyte, 23 p. 439.

¹ Ind. = Indifferent.

E. limosum L.

Ind.; on wet clay poor in lime, 85 p. 87; ind. hydrophyte, 51 ix, p. 311; ind., 34 p. 126.

Lycopodium Selago L.

Oxylophyte; on siliceous soils, 15 xx, p. 289; ind., somewhat hygrophilous, 15 ii, p. 299; silicolous, 51 ii, p. 74 and ix, p. 323; silicolous, 34 p. 169; silicolous, 65 p. 228; on mica slate, 83 p. 118; on primitive rocks, 8 p. 375; in acid bogs, 71 p. xxxi.

L. annotinum L.

Oxylophyte; ind., 15 ii, p. 299; silicolous, 34 p. 169; silicolous, 65 p. 228; on mica slate, 83 p. 118.

L. clavatum L.

Oxylophyte; ind. calcifuge, somewhat hygrophilous, 15 ii, p. 301; ind. calcifuge, 47 p. xlii; silicolous, 51 ii, p. 74 and ix, p. 325; silicole, 34 p. 169; on mica slate, 83 p. 118; on primitive rocks, 8 p. 375.

Selaginella selaginoides (L.) Link.

Calcicole; calcicole, in swamps, 85 p. 158; ind. calciphile, 90 p. 271; calciphile, 29 p. 158.

Potamogeton natans L.

Hydrophyte; ind. hydrophyte, 15 ii, p. 299; calcicolous hydrophyte, 51 ii, p. 80; hydrophyte, preferring muddy and calcareous waters, 51 viii, p. 457; in alkaline waters, 34 p. 149; hydrophyte of calcareous waters, 65 p. 211.

Zostera marina L.

Halophyte; pelophilous halophyte, 96 p. 230; halophyte, of mud flats, 85 p. 332; halophyte, 23 p. 435; halophyte, 84 p. 404.

Zannichellia palustris L.

Ind. halophyte; subaritime, 15 ii, p. 291; ind. calcifuge, hydrophile, 15 ii, p. 301; calcicolous hydrophyte, 51 ii, p. 80.

Triglochin palustris L.

Ind. halophyte; oxylophyte, 96 pp. 197 and 202; ind., 15 ii, p. 298; on wet clay poor in lime, 85 p. 87; on subaritime fen, 85 p. 244; halophyte, 51 ii, p. 82 and viii, p. 443.

T. maritima L.

Ind. halophyte; maritime hygrophyte, 15 ii, p. 290; halophyte, 51 ii, p. 82; psammophilous halophyte, 23 p. 436; pelophilous halophyte, 96 p. 231; halophyte, 74 iv, p. 54; on subaritime fen, 85 p. 244; halophyte, of muddy marshes, 85 pp. 332 and 333; halophyte, 51 viii, p. 441; halophyte, 34 p. 115; halophyte, 83 p. 115.

Scheuchzeria palustris L.

Oxylophyte; oxylophyte of high moors, 96 pp. 195 and 202; silicolous hydrophyte, 51 ii, p. 78; on peat bogs, 34 p. 151; on peat bogs in granitic regions, 65 p. 210; ind., 63 p. 418; on *Sphagnum* bogs in granitic regions, 49 p. 39.

Phleum pratense L.

Ind.; ind., 15 xx, p. 299; on damp clays poor in lime, 85 p. 85; on chalk grassland, 85 pp. 178 and 179; ind., 51 ix, p. 160; ind., 34 p. 126; ind., 65 p. 220; ind., 4 p. 121.

Agrostis alba L., var. *maritima* (Lam.) G. F. W. Mey.

Psammophilous halophyte; psammophilous halophyte, 96 p. 231; psammophilous halophyte, 23 p. 436.

Deschampsia flexuosa (L.) Trin.

Oxylophyte; confined to siliceous soils, 15 xx, p. 274; calcifuge, 15 ii, pp. 303 and 224; on dry grass heaths on sand, 85 p. 96; on lichen heath or tundra, 96 p. 209; on heath, 85 pp. 105 and 116; on Scotch pine heaths, 85 p. 119; on siliceous grassland, 85 p. 135; on heather moor, 85 p. 278; in sandy coniferous woods, 90 p. 275; on *Sphagnum* moors, 77 p. 102; on acid humus, 77 p. 111; exclusive calcifuge, 47 p. xli; silicolous, 51 ii, p. 73 and ix, p. 198; silicolous, 61 p. 87; ind., 65 p. 221; on granite, 63 p. 411; silicolous, 8 p. 376; silicolous, 4 p. 119.

Spartina alterniflora Loisel.

Halophyte; maritime pelophilous hydrophyte, 15 ii, p. 290; halophyte, 85 p. 337.

Catabrosa aquatica (L.) Beauv.

At the semi-fresh, springy borders of salt marshes; fresh marsh, 85 p. 207; ind., 34 p. 126; ind., 65 p. 223.

Poa annua L.

Ind.; ind., 15 ii, p. 299; on shingle beaches, 85 p. 361; ruderal, 51 ii, p. 81; ind., 51 ix, p. 232; ind., 34 p. 126; ind., 65 p. 222; ind., 4 p. 121.

P. alpina L.

Calcicole; ind., 15 ii, p. 299; silicolous, 51 ii, p. 73 and ix, p. 234; on mica and calcareous schists, 92 p. 28; on slate mountains, 40 p. 93; calcicole, 1 p. 537; ind., 63 p. 416; calciphile, 10 p. 327; calciphile, 80 p. 411; ind. calciphile, 29 p. 159.

P. pratensis L.

Ind.; ind., 15 ii, p. 299; ind., 51 ix, p. 241; ind., 65 p. 222; ind., 34 p. 126.

Festuca rubra L.

Ind.; ind. calcifuge, somewhat psammophilous, 15 ii, p. 301; on maritime dunes, 85 p. 344; silicolous, 51 ii, p. 73; preferential silicole, 51 ix, p. 265; ind., 65 p. 223; often a pelophilous halophyte, 96 p. 231; on dry sand-fields, 96 p. 266; ind., 34 p. 126; ind., 4 p. 121.

Eleocharis palustris (L.) R. Br.

Ind., hydrophyte; ind., 15 ii, p. 299; on wet clay poor in lime, 85 p. 87; in reed swamp poor in salts, 85 p. 194; silicolous hydrophyte, 51 ii, p. 78; ind., 34 p. 125; in alkaline waters, 34 p. 150; hydrophyte, 65 p. 217.

Scirpus cespitosus L.

Oxylophyte; oxylophyte of high moors, 96 pp. 194 and 202; on wet heath, 85 p. 106; on siliceous grassland, 85 p. 136; on cotton-grass moor, 85 p. 271; on upland moor, 85 p. 272; on heather moor, 85 p. 278; calcifuge, hygrophilous psammophyte, 15 ii, p. 303; on moors, 90 p. 283; hydrophytic silicole, 51 ii, p. 78 and ix, p. 58; on peat bogs, 34 p. 151; on acid rocks, 56 p. 12; on peat bogs on granite, 65 p. 217; ind., 63 p. 417; in acid bogs, 71 p. xxxi; on potassic soils, 29 p. 159.

Scirpus hudsonianus (Michx.) Fernald.

Calcicole; silicolous hydrophyte, 51 ii, p. 79, silicolous, 63 p. 417.

Eriophorum angustifolium Roth.

Hydrophilous oxylophyte; on wet heaths, 85 p. 106; on fens, 85 p. 233; *Sphagnum* moor, 85 pp. 263 and 267; on cotton-grass moors, 85 p. 270; in bog holes in heather moor, 85 p. 279; ind. calcifuge, 47 p. xliii; hydrophytic silicole, 51 ii, p. 79 and ix, p. 75; on peat bogs, 34 p. 151; ind., hydrophyte, 65 p. 217; on acid bogs, 71 p. xxxi; *Sphagnum* bogs on granite, 49 p. 39.

Rhynchospora alba (L.) Vahl.

Hydrophilous oxylophyte; oxylophyte of high moors, 96 p. 202; confined to siliceous soils, 15 xx, p. 274; hydrophilous calcifuge, 15 ii, p. 302; on wet heaths, 85 p. 106; moor, 85 p. 249; on *Sphagnum* moor, 85 pp. 263 and 267; moor, 90 p. 283; hydrophytic silicole, 51 ii, p. 78 and ix, p. 52; hydrophytic silicole, 34 p. 168; hydrophyte, 65 p. 218; on peat bogs, 83 p. 115; on acid bogs, 71 p. xxx.

Carex pauciflora Lightf.

Oxylophyte; oxylophyte, 96 p. 194; calcifuge, 15 ii, p. 303; exclusive calcifuge, 47 p. xli; hydrophytic silicole, 51 ii, p. 79 and ix, p. 82; on peat bogs, 34 p. 151; peat bogs on granite, 65 p. 218; on potassic soils, 29 p. 160.

C. limosa L.

Hydrophilous oxylophyte; oxylophyte, 96 p. 195; hydrophytic silicole, 51 ii, p. 79 and ix, p. 101; on peat bogs, 34 p. 151; hydrophytic silicole, 65 p. 219; on acid bogs, 71 p. xxxi; calcifuge, 15 p. 303; on reed swamps in moors, 85 p. 262; calcifuge, 47 p. xli; on moors, 90 p. 282; on *Sphagnum* bog on granite, 49 p. 39.

C. capillaris L.

Ind. calcicole; calciphile, 13 p. 314; ind. calciphile, 30 p. 230; calciphile, 77 p. 100; ind. calciphile, 90 p. 281; calciphile, 79 p. 319.

Calla palustris L.

Hydrophilous oxylophyte; hydrophytic calcifuge, 15 ii, p. 302; in boggy woods or moors, 90 p. 287; hydrophytic silicole, 65 p. 212.

Juncus bufonius L.

Ind. oxylophyte; ind., on wet clay or sand, 15 ii, p. 299; hydrophytic silicole, 51 ii, p. 78 and ix, p. 22; hydrophytic silicole, 61 p. 86; ind., 65 p. 216; ind., 4 p. 121.

J. trifidus L.

Oxylophyte; on lichen heath on tundra, 96 p. 209; on potassic soils, 29 p. 160; calciphobous, 77 p. 104; on mica schist, 92 p. 26; silicolous, 63 p. 417; calcifuge, 48 p. 254; silicolous, 9 p. 219; on primitive rocks in the mountains, 76 p. 146.

J. filiformis L.

Oxylophyte; hydrophytic silicole, 51 ii, p. 78 and ix, p. 16; silicolous, 34 p. 168; silicolous, 65 p. 216; on granite, 63 p. 411; ind., 63 p. 417; on granite, 34 p. 111; silicolous, 56 p. 14; on *Sphagnum* bog on granite, 49 p. 39; on potassic soils, 29 p. 160.

Streptopus amplexifolius (L.) DC.

Ind.; silicolous, 65 p. 214; ind., 63 p. 418; ind., 15 ii, p. 298; calciphile, 90 pp. 172 and 291; ind., 51 viii, p. 560.

Listera cordata (L.) R. Br.

Oxylophyte; on siliceous soils, 85 p. 139; on heather moors, 85 p. 278; in mossy coniferous woods, 90 p. 289; in mossy coniferous woods, almost parasitic, 51 viii, p. 524; ind. calciphile, 63 p. 418; ind., 34 p. 125.

Salix phylicifolia L.

Ind. oxylophyte; silicolous, 51 viii, p. 381; ind., 63 p. 418; on potassic soils, 29 p. 160.

Myrica Gale L.

Oxylophyte; *Sphagnum* bogs (high moor), 96 p. 202; calcifuge, 15 ii, p. 302; in woods on siliceous soils, 85 p. 139; silicolous, 56 p. 16.

Rumex Acetosella L.

Ind. oxylophyte; ind., 60 p. 104; silicolous, 4 p. 119; calcifuge, 47 p. xli; on sandy places, 90 p. 300; silicolous, 51 ii, p. 72 and viii, p. 233; silicolous, 34 p. 168; silicolous, 9 p. 209; ind. silicole, 61 p. 84; ind., 65 p. 205; calcifuge, 15 xx, p. 274 and ii, p. 302; on potassic soils, 74 iv, p. 53; on dry grass heath on sand, 85 p. 96; it tolerates more lime than most calcifuges, 15 ii, p. 256; siliceous soils, 85 p. 129.

Polygonum aviculare L.

Ind.; ind., 15 ii, p. 298; ind., 51 viii, p. 248.

P. viviparum L.

Ind.; ind., 15 xx, p. 289 and ii, p. 298; silicolous, 51 ii, p. 72 and viii, p. 239; on limestone, 83 p. 139; ind., 63 p. 418.

P. lapathifolium L.

Ind.; ind., 15 ii, p. 298; ind. and hydrophytic, 51 viii, p. 242; ind., 34 p. 124.

P. Convolvulus L.

Ind.; ind., 15 ii, p. 298; ind., 51 ii, p. 60 and viii, p. 251.

Salsola Kali L.

Psammophilous halophyte; psammophilous halophyte, 96 p. 226; maritime psammophyte, 15 ii, p. 290; halophile, 74 iv, p. 54; sea strand, 85 p. 340; halophyte, 51 ii, p. 81 and viii, p. 193; halophyte, 56 p. 13.

Sagina procumbens L.

Ind.; ind., 15 ii, p. 294; on dry grass heath on sand, 85 p. 95; hydrophytic preferential silicole, 51 v, p. 264; hydrophytic silicole, 61 p. 84; silicolous, 60 p. 79; ind., 34 p. 120; ind. and hydrophytic, 65 p. 103; silicolous, 4 p. 119.

Arenaria peploides L.

Psammophilous halophyte; psammophilous halophyte, 96 p. 226; maritime psammophyte, 15 ii, p. 289; on sea strands, 85 p. 340.

Stellaria media (L.) Cyrill.

Ind.; ind., 15 ii, p. 294; ind., 51 v, p. 292; ind., 65 p. 164; ind. 70 p. 125.

Cerastium arvense L.

Ind.; ind. calciphile, 15 ii, p. 293; on dry grassland on sand, 85 p. 95; calcicolous, 85 p. 176; ind., 51 v, p. 309; on slate mountains, 40 p. 93; ind., 34 p. 120; ind., 4 p. 120.

C. vulgatum L.

Ind.; ind., 15 ii, p. 294; on slate mountains, 40 p. 93; ind., 65 p. 164; ind., 34 p. 120.

Silene acaulis L.

Oxylophyte; chasinophyte, 96 p. 244; on granite in the Alps, 13 p. 358; on mica and calcareous schists, 92 p. 28; calciphile, 36 p. 168; calciphile, 9 p. 196; on limestone and slate, 76 p. 109; ind., 63 p. 425; calciphile, 10 p. 327; ind., 70 p. 124; on potassic soils, 29 p. 161.

Ranunculus repens L.

Ind.; on dry clay poor in lime, 85 p. 85; wet clay, 90 p. 359; ind., 51 iv, p. 477; ind., 65 p. 156; ind., 70 p. 114.

R. acris L.

Ind.; ind., 15 ii, p. 295; on dry clay poor in lime, 85 p. 85; on chalk grassland, 85 p. 176; ind., 51 iv, p. 473; on pastures in slate mountains, 40 p. 92; ind., 70 p. 114; ind., 34 p. 120; ind., 65 p. 156.

Caltha palustris L.

Calcicole; ind. and hydrophytic, 15 p. 294; on the low moor (rich in Ca and K, but acid), 96 p. 197; on damp siliceous soils, 85 p. 128; calcicole, 85 p. 158; hydrophytic silicole, 51 ii, p. 76; ind., hydrophytic and to some degree a calcifuge, 51 iv, p. 489; ind., 70 p. 114; ind., 34 p. 120; hydrophyte, 65 p. 157.

Thlaspi arvense L.

Ind.; ind. calciphile, 15 ii, p. 57; ind., 51 ii, p. 57; preferential calciphile, 51 v, p. 117.

Capsella Bursa-pastoris (L.) Moench.

Ind.; ind., 15 ii, p. 294; ruderal, 90 p. 346; ruderal, 51 ii, p. 80; ind., 51 v, p. 137; ind., 65 p. 159; ind., 70 p. 120; ind., 34 p. 120.

Arabis alpina L.

Calcicole; preferential silicole, 51 v, p. 48; on calcareous schists, 92 p. 27; calciphile, 40 p. 128; on calcareous and micaceous schists, 76 p. 97; ind., 63 p. 425; calciphile, 29 p. 161; on the calcareous fell-fields of the European mountains, 96 p. 258; calciphile, 15 xx, p. 275; and ii, p. 291; on limestone mountains, 76 p. 148; calciphile, 79 p. 299.

Drosera rotundifolia L.

Hydrophilous oxylophyte; confined to siliceous soils, 15 xx, p. 274; *Sphagnum* moor, 85 p. 263; in bog holes in the heather moor, 85 p. 279; hydrophytic silicole, 51 ii, p. 77; hydrophyte, a preferential silicole, 51 v, p. 197; on peat bogs, 34 p. 151; silicolous, 65 p. 162; ind., 63 p. 425; hydrophytic silicole, 8 p. 376; on acid bogs, 71 p. xxxi; *Sphagnum* bogs on granite, 50 p. 39; silicolous, 4 p. 119.

D. anglica Huds.

Hydrophilous oxylophyte; peat bog, 34 p. 151; on bogs on granite, 65 p. 162; on secondary rocks, 8 p. 380; on acid bogs, 71 p. xxx.

D. longifolia L.

Hydrophilous oxylophyte; on wet heaths, 85 p. 106; on *Sphagnum* moor, 85 p. 263; hydrophytic silicole, 51 ii, p. 77; hydrophyte, preferential silicole, 51 v, p. 198; on peat bogs, 34 p. 151; ind., 63 p. 425; hydrophytic silicole, 8 p. 376; on acid bogs, 71 p. xxxi.

Sedum villosum L.

Oxylophyte; calcifuge, 15 ii, p. 303; calcifuge, 47 p. xl; hydrophytic silicole, 51 ii, p. 77, and vi, p. 198; on granite mountains, 60 p. 89; silicole, 4 p. 119; on granite, 34 p. 110; on wet granite rocks, 65 p. 176; ind., 63 p. 423.

S. roseum (L.) Scop.

Ind.; chasmophyte, 96 p. 245; ind. calcifuge, and lithophyte, 15 ii, p. 300; on granite in Alps, 13 p. 358; on potassic rocks, 90 p. 181; on clay slates, 90 p. 194; calciphile, 36 p. 168; on granite rocks, 65 p. 176; ind. silicole, 63 p. 423; on granite, 34 p. 110.

Saxifraga aizoides L.

Calcicole; ind., somewhat hydrophytic, 15 ii, p. 295; calciphile, 30 p. 231; ind., 63 p. 422; calciphile, 10 p. 327; calciphile, 29 p. 161.

S. Aizoon Jacq.

Calcicole; ind. calciphile, 15 ii, p. 293; preferential calciphile, 90 p. 337, silicole, 51 ii, p. 69; on granites of the Gothard, 87 i, p. 352; ind., 51 vi, p. 234; on limestone, and mica slate, 83 p. 139; ind. calciphile, 63 p. 422; calciphile, 79 p. 307; chasmophyte, 96 p. 244; calciphile, 29 p. 161; ind. calciphile, 90 p. 174; on micaceous and calcareous schists, 92 pp. 26 and 28; on granite, 65 p. 177; calcifuge, 47 p. xlii.

S. oppositifolia L.

Calcicole; chasmophyte, 96 p. 244; calciphile, 13 p. 313; calciphile, 90 pp. 180 and 336; calciphile, 36 p. 168; calciphile, 9 p. 196; calciphile, 30 p. 231; calcicole in the Carpathians according to Wahlenberg, ind. in Switzerland according to H. Christ, 77 p. 100; on micaceous and calcareous schists, 92 p. 28; ind., 83 p. 138; calciphile, 84 p. 125; ind., 63 p. 422; calciphile, 29 p. 161.

Potentilla palustris (L.) Scop.

Hydrophilous oxylophyte; on low moors (rich in Ca and K, but acid) 96 p. 197; in ditches, 90 p. 363; in peat bogs, 34 p. 151; silicolous, 60 p. 86; on potassic soils, 29 p. 161; calcifuge, hydrophytic psammophyte, 15 ii, p. 301; edge of moor, 85 p. 251; silicolous, 34 p. 166; hydrophytic silicole, 65 p. 171.

P. fruticosa L.

Calcicole; calciphile, 70 p. 140; calciphile, 64 p. 114.

Geum rivale L.

Calcicole; ind., 15 ii, p. 295; on low moors (rich in Ca and K, but acid) 96 p. 197; on damp siliceous soils, 85 p. 128; calciphile, 85 pp. 150 and 158; ind., calcifuge, 47 p. xlii; on wet moors, 90 p. 363; hydrophytic silicole, 51 ii, p. 77 and v, p. 21; silicole, 65 p. 170; on *Sphagnum* bogs on granite, 49 p. 39.

Rubus Chamæmorus L.

Oxylophyte; oxylophyte, 96 p. 196; on upland *Sphagnum* bogs, 85 p. 267; on potassic soils, 29 p. 161.

Trifolium pratense L.

Ind.; calciphile or ind., 15 xx, p. 286; ind., 15 ii, p. 295; on dry clay poor in lime, 85 p. 85; on chalk grassland, 85 p. 176; on fixed dunes, 85 p. 345; ind. calcifuge, 51 v, p. 497; on slate mountains, 40 p. 93; ind., 65 p. 168; ind., 34 p. 121.

T. repens L.

Ind.; ind., 15 ii, p. 295; on dry clay poor in lime, 85 p. 85; on fixed dunes, 85 p. 345; ind., 51 ii, p. 57 and v, p. 522; on slate mountains, 40 p. 93; ind., 65 p. 168; ind., 4 p. 120; ind., 34 p. 120.

Vicia Cracca L.

Ind.; ind., 15 ii, p. 295; on chalk grasslands, 85 p. 177; on clay poor in lime, 85 p. 82; hydrophyte, ind., 51 v, p. 568; ind., 65 p. 169; ind., 51 ii, p. 57; ind., 4 p. 120.

Empetrum nigrum L.

Oxylophyte; calcifuge, 15 ii, p. 303; on sand dunes, 96 pp. 264 and 268; calcifuge, 85 p. 157; silicolous, 51 ii, p. 72 and viii, p. 273; silicolous, 34 p. 166; silicolous, 56 p. 16; on peat bogs on granite, 65 p. 207; ind. silicole, 63 p. 418; on mountains of primitive rocks, 76 p. 148; on granite, 49 p. 39; on potassic soils, 29 p. 161.

Epilobium angustifolium L.

Ind.; ind., 15 ii, p. 295; ind., 51 vi, p. 119; ind., 65 p. 174; ind., 63 p. 423; ind., 79 p. 305; silicole, 4 p. 119; ind., 34 p. 121; on gneiss, 83 p. 141.

E. palustre L.

Hydrophilous oxylophyte; calcifuge, 47 p. xli; silicolous, 34 p. 166; silicolous, 65 p. 174; on low moors (rich in Ca and K, but acid), 96 p. 197; hydrophytic calcifuge, 15 xx, p. 301; on damp siliceous soils, 85 p. 128; hydrophytic silicolous, 51 vi, p. 126; silicolous, 60 p. 87; on *Sphagnum* bog on granite, 49 p. 39.

Circæa alpina L.

Ind. oxylophyte; ind., hydrophytic, 15 ii, p. 295; ind. calcifuge, 47 p. xlii; ind. silicolous, 51 vi, p. 137; silicolous, 56 p. 12; silicolous, 65 p. 174; ind., 63 p. 423.

Moneses uniflora (L.) Gray.

Oxylophyte; ind., 15 ii, p. 297; silicolous, 51 ii, p. 71 and vi, p. 363; ind., 63 p. 420; silicolous, 4 p. 120.

Pyrola minor L.

Ind. calcicole; ind., 15 ii, p. 297; on siliceous soils, 85 p. 129; ind. calcifuge, 46 p. xlii; silicole, 51 ii, p. 71 and vi, p. 358; on granite, 65 p. 193; on mica slate, 83 p. 131; ind., 63 p. 420.

Loiseleuria procumbens (L.) Desv.

Oxylophyte; when it thrives on calcareous mountains it is on deep raw acid humus, 96 p. 213; silicolous, 9 p. 209; ind., 63 p. 420; ind., 79 p. 311.

Vaccinium uliginosum L.

Oxylophyte; on high moors (*Sphagnum* bogs), 96 p. 202; confined to siliceous soils, 15 xx, p. 274; on *Sphagnum* moors, 77 p. 102; hydrophytic silicole, 51 ii, p. 78 and vi, p. 335; on peat bogs, 34 p. 151; silicolous, 56 p. 14; silicole, 9 p. 209; silicolous, 65 p. 192; silicolous, 60 p. 98; ind., 63 p. 420; on granite, 49 p. 39; on potassic soils, 29 p. 163.

V. Oxycoccus L.

Hydrophilous oxylophyte; oxylophyte, 96 pp. 194 and 202; calcifuge, 15 xx, p. 303; on wet heaths, 85 p. 106; hydrophytic silicolous, 51 ii, p. 78; silicolous, 56 p. 14; silicole, 65 p. 192; silicolous, 60 p. 98; hydrophytic silicolous, 8 p. 377; on acid bogs, 71 p. xxx; on granite, 49 p. 39.

Diapensia lapponica L.

Oxylophyte, on acid rocks; oxylophyte, 96 p. 214; on potassic rocks, 29 p. 163.

Gentiana Amarella L.

Calcicole; on calcareous or siliceous grasslands, 85 pp. 177 and 179, and 135; calciphile, 10 p. 330; calciphile, 70 p. 13; calciphile, 29 p. 163.

Menyanthes trifoliata L.

Hydrophilous oxylophyte; ind. calcifuge, 47 p. xlii; hydrophytic silicole, 51 ii, p. 78; on peat bogs, 34 p. 151; hydrophytic silicole, 65 p. 195; on *Sphagnum* bogs on granite, 49 p. 39; on potassic soils, 29 p. 163; on low moors (rich in K and Ca, but acid), 96 p. 197; ind. calcifuge and hydrophyte, 15 ii, p. 300.

Mertensia maritima (L.) S. F. Gray.

Psammophilous halophyte; psammophilous halophyte, 96 p. 226; on shingle beaches, 85 p. 361.

Galeopsis Tetrahit L.

Ind.; ind., 15 ii, p. 297; in cultivated places, 90 p. 331; ind., 51 viii, p. 63; ind. silicole, 61 p. 84; ind., 4 p. 121; ind., 34 p. 124.

Limosella aquatica L.

Hydrophyte and somewhat an oxylophyte; calcifuge, 15 ii, p. 303; hydrophytic silicole, 51 ii, p. 78; near alkaline waters, 34 p. 148; hydrophyte, 65 p. 198.

Plantago major L.

Ind.; on grassy places, 90 p. 313; ind., 34 p. 124; ind., 65 p. 204.

Campanula rotundifolia L.

Ind.; ind., 15 ii, p. 297; on siliceous soils, 85 p. 129; on chalk grassland, 85 pp. 177 and 179; ind., 90 p. 314; ind., 51 ii, p. 59 and vi, p. 308; on slate mountains, 40 p. 93; ind., 34 p. 123; on limestones, 36 p. 168; ind., 65 p. 192; silicolous, 8 p. 376.

Gnaphalium uliginosum L.

Ind. oxylophyte; on wet clay poor in lime, 85 p. 86; ind. calcifuge, 47 p. xli; ind., 65 p. 186; ind., 34 p. 122.

Achillea Millefolium L.

Ind.; ind., somewhat xerophytic, 15 ii, p. 296; on dry grass heath on sand, 85 p. 96; on calcareous grassland, 85 pp. 159 and 177; ind., 51 ii, p. 58; ind., 34 p. 122.

Tanacetum vulgare L.

Ind.; ind. calcifuge, 15 ii, p. 300; ind., 51 ii, p. 58; ind., 60 p. 93; ind. 79 p. 309; ind., 4 p. 120.

Senecio vulgaris L.

Ind.; ind., 15 ii, p. 296; on sand dunes, 85 p. 349; ind. halophyte, 51 vi, p. 112; ind., 34 p. 122; ind., 65 p. 186.

Cirsium arvense (L.) Scop.

Ind.; ind., 15 ii, p. 296; ind., 51 vi, p. 142.

Leontodon autumnalis L.

Ind.; ind., 15 ii, p. 296; on dry clay poor in lime, 85 p. 86; on calcareous grassland, 85 pp. 159 and 177; ind., 51 ii, p. 59; ind., 65 p. 189; ind., 34 p. 123.

Taraxacum officinale Weber.

Ind.; ind., 15 ii, p. 296; on dry clay poor in lime, 85 p. 86; on chalk grassland, 85 p. 177; ind., 65 p. 190; ind., 63 p. 421.

The soil preferences of the 103 species of circumpolar range, here tabulated, may be briefly summarized as follows:

LIST OF CIRCUMPOLAR HALOPHYTES

<i>Zostera marina</i>	<i>Spartina alterniflora</i>
<i>Triglochin maritima</i>	

LIST OF CIRCUMPOLAR PSAMMOPHILOUS HALOPHYTES

<i>Agrostis alba</i> , var. <i>maritima</i>	<i>A. peploides</i> , var. <i>diffusa</i>
<i>Salsola Kali</i>	<i>A. peploides</i> , var. <i>robusta</i>
<i>Arenaria peploides</i>	<i>Mertensia maritima</i>

LIST OF CIRCUMPOLAR INDIFFERENT HALOPHYTES

<i>Zannichellia palustris</i>	<i>Catabrosa aquatica</i>
<i>Triglochin palustris</i>	

LIST OF CIRCUMPOLAR CALCICOLES

<i>Thelypteris Robertiana</i>	<i>Selaginella selaginoides</i>
<i>Asplenium viride</i>	<i>Potentilla fruticosa</i>

LIST OF CIRCUMPOLAR INDIFFERENT CALCICOLES

<i>Botrychium Lunaria</i>	<i>Arabis alpina</i>
<i>Potamogeton natans</i>	<i>Saxifraga aizoides</i>
<i>Poa alpina</i>	<i>S. Aizoon</i>
<i>Carex capillaris</i>	<i>S. oppositifolia</i>
<i>Thlaspi arvense</i>	<i>Gentiana Amarella</i>

LIST OF CIRCUMPOLAR OXYLOPHYTES

<i>Lycopodium Selago</i>	<i>Myrica Gale</i>
<i>L. annotinum</i>	<i>Drosera rotundifolia</i>
<i>L. clavatum</i>	<i>D. anglica</i>
<i>Scheuchzeria palustris</i>	<i>D. longifolia</i>
<i>Deschampsia flexuosa</i>	<i>Sedum villosum</i>
<i>Scirpus cæspitosus</i>	<i>Potentilla palustris</i>
<i>Eriophorum angustifolium</i>	<i>Rubus Chamæmoris</i>
<i>Rhynchospora alba</i>	<i>Empetrum nigrum</i>
<i>Carex pauciflora</i>	<i>Epilobium palustre</i>
<i>C. limosa</i>	<i>Loiseleuria procumbens</i>
<i>Calla palustris</i>	<i>Vaccinium uliginosum</i>
<i>Juncus trifidus</i>	<i>V. Oxycoccus</i>
<i>J. filiformis</i>	<i>Diapensia lapponica</i>

LIST OF CIRCUMPOLAR INDIFFERENT OXYLOPHYTES

<i>Juncus bufonius</i>	<i>Circæa alpina</i>
<i>Listera cordata</i>	<i>Moneses uniflora</i>
<i>Salix phylicifolia</i>	<i>Menyanthes trifoliata</i>
<i>Rumex Acetosella</i>	<i>Limosella aquatica</i>
<i>Sagina procumbens</i>	

LIST OF CIRCUMPOLAR INDIFFERENT PLANTS

<i>Cystopteris fragilis</i>	<i>Silene acaulis</i>
<i>Thelypteris spinulosa</i>	<i>Ranunculus repens</i>
<i>T. Phegopteris</i>	<i>R. acris</i>
<i>T. Dryopteris</i>	<i>Caltha palustris</i>
<i>Equisetum arvense</i>	<i>Capsella Bursa-pastoris</i>
<i>E. sylvaticum</i>	<i>Sedum roseum</i>
<i>E. palustre</i>	<i>Geum rivale</i>
<i>E. limosum</i>	<i>Trifolium pratense</i>
<i>Phleum pratense</i>	<i>T. repens</i>
<i>Poa annua</i>	<i>Vicia Cracca</i>
<i>P. pratensis</i>	<i>Epilobium angustifolium</i>
<i>Festuca rubra</i>	<i>Pyrola minor</i>
<i>Eleocharis palustris</i>	<i>Galeopsis Tetrahit</i>
<i>Scirpus hudsonianus</i>	<i>Plantago major</i>
<i>Streptopus amplexifolius</i>	<i>Campanula rotundifolia</i>
<i>Polygonum aviculare</i>	<i>Gnaphalium uliginosum</i>
<i>P. viviparum</i>	<i>Achillea Millefolium</i>
<i>P. lapathifolium</i>	<i>Tanacetum vulgare</i>
<i>P. Convolvulus</i>	<i>Senecio vulgaris</i>
<i>Stellaria media</i>	<i>Cirsium arvense</i>
<i>Cerastium arvense</i>	<i>Leontodon autumnalis</i>
<i>C. vulgatum</i>	<i>Taraxacum officinale</i>

It will be seen that in most cases the various individual observations agree in a manner all the more surprising considering that the data have been gathered by many botanists at widely separated places and times. Of the plants listed there are few concerning which the data seem to be contradictory.

RELATION BETWEEN THE CHEMICAL NATURE OF THE SOIL AND THE DISTRIBUTION OF VASCULAR PLANTS

Cowles has recently stated that:

"Blytt, De Candolle, and other students long ago called attention to the fact that close observation for many years in a region rich in various rock types would result in eliminating most of the so-called siliceous and calcareous plants and that most plants would be found in most soils. Even in the few exceptions to this rule a study conducted over the entire area occupied by a species would show that it grows naturally in most soils."¹

De Candolle in 1855 expressed a similar conviction.² But many other naturalists have arrived at exactly opposite conclusions. They claim that, although the relations between the natural distribution of the plant and the amount of available lime in the soil are complex, nevertheless they are definite enough and fundamental enough to deserve and repay years of careful study.

Lecoq defined in the following terms the conditions under which a study should be made: "It is impossible to refer each one of our species to one special soil from which no one individual may swerve. It is, therefore, necessary to consider only the whole of the species or perhaps the average and pay no attention to eccentricities."³

¹ Cowles, H. C., Bull. Am. Bur. Geog., ii, 167 (1901).

² De Candolle, A., "Géographie Botanique Raisonnée," i, 422 (1855).

³ Lecoq, H., "Études sur la géographie botanique de l'Europe," ii, 51 (1854).

This statement of Lecoq's emphasizes the fact that in physiological ecology, exceptions do occur. We must bear this in mind, but we must not let it blind us. Because a single individual is once observed upon a siliceous soil, we must not forget that in every other known case, the species occurs on calcareous soils. Although our list contains a few species to which various workers assign irreconcilable soil preferences, we must remember that their observations on most of the species tally with surprising regularity.

Observations on the relations between the edaphic factors and the distribution of a species are not new; they have been frequent during the last century and a quarter. Various diametrically opposed theories have been advanced to explain the observed relations. In fact, for many years there has been a spirited controversy as to whether certain plants occurred on certain definite types of soil because of its physical properties, such as its ability to absorb moisture and heat, etc., or because of its chemical properties, as its content of NaCl or CaCO₃. The question has simmered down to this: do plants within the same climatic zone depend more upon the physical or on the chemical nature of the soil?

The group of halophytes was one of the earliest to be recognized. It was noticed that they occurred in a narrow belt along the shore within the influence of sea water, and in the salt deserts or by salt springs and lakes in the interior of continents. That their distribution and their distinctive morphological characters are directly dependent upon the presence in considerable quantities of certain salts, notably NaCl, is very generally accepted. Even such an ardent champion of the physical theory as Jules Thurmann did not attempt to apply it to the halophytes, saying: "However, it is impossible to overlook the influence of certain salts on the occurrence and, therefore, the dispersion of certain species. Among such is marine salt and not to speak of its evident action on the sea-coasts, our own country shows striking examples in this regard."¹

Cowles, writing on this subject, does suggest that the physical factors are the determining ones, when he says: "The halophytes form an excellent case in point; although salt plants have been all but universally instanced as illustrations of the influence of chemical factors, it may yet be proved that it is a physical rather than a chemical property of the salts which is detrimental to the activity of so many plants."²

In these days when the distinctions between physics and chemistry are being so nearly obliterated, one hesitates to contradict the statement that "it may yet be proved that it is a physical rather than a chemical property of the salts which is detrimental to the activity of so many plants." Whether or not it is a physical property of the salt, it is at least a physical property which is never duplicated in non-saline soils. Otherwise we should have frequent cases of typical halophytes occurring in non-saline habitats. Professor Cowles, like many other champions of the physical theory, neglects the fact that many plants never succeed in growing unless certain chemicals are present in certain quantities. This is all that the champions of the chemical theory maintain. That is what they mean when they say

¹ Thurmann, J., "Essai de Phytostatique," i, 351 (1849).

² Cowles, H. C., Bull. Am. Bur. Geog., ii, 166 (1901).

that the chemical constituents of the soil do have a limiting effect upon the vegetation. The exact physiological relations between the plant and that heterogeneous complex, the soil, are not well enough known to allow us to go much further.

One of the major groups into which we have sorted our plants is that of the calcicoles or calciphiles. Is this a definite and well-recognized category?

"If a sand hill or a clay hill, a granite hill or a limestone hill, have different floras, it is not because of differences in the rock nor of the inorganic soil which comes from it, but it is because one is farther along in its life history than is the other."¹ This is the well-known doctrine of succession, which explains many conditions, such as the appearance after a fire of an entirely different type of vegetation from that occupying the ground before, but in the case of the floras of a granite and a limestone hill, the differences are such that they cannot be explained by this doctrine. One may be "farther along in its life history" than the other, but no mere lapse of time will ever allow it to attain to any typical stage of the former.

Another theory is that most plants do not grow in the places best suited to them but in the places into which they are forced. "After having studied for eleven years the flora of Algiers, I have acquired the conviction that the plants do not in most cases inhabit the localities which would suit them best, but rather those where they can escape competition with their neighbours and resist their enemies. I find that the plants which are definitely located are actually plants which have taken refuge after not being able to sustain elsewhere the struggle for life and that the terms psammophilous and xerophilous, etc., are improperly used."² Granted that some vigorous plants are able to overrun a locality and eject the species already established there, is this struggle for existence so severe and universal as to account for the manifold correlations between the stations of certain plants and certain types of soil? To use as an example a psammophyte: does *Ammophila breviligulata* occur on siliceous sand dunes and beaches simply because it is crowded out from the other habitats by more aggressive species? If *Ammophila*, certainly a most aggressive plant in its special habitat, would really grow better on other soils, why does it never appear upon them? The struggle for existence among the various plant species is not, ordinarily, so severe as to make it impossible that somewhere in a region a given species should be able to populate quite different soils.

In the case of the calcicoles, however, there is by no means such a nearly unanimous verdict, as is the case in respect to the halophytes, that the chemical nature of the soil does have a direct determining influence on the vegetation.

Those in favour of the physical theory have been so numerous, that the ideas of only some of the more prominent exponents of this theory will be discussed.

¹ Cowles, H. C., Bull. Am. Bur. Geog., ii, 169 (1901).

² Battandier, A., Bull. Soc. Bot. France, xxxiv, 189-90 (1887).

Alphonse De Candolle gave attention to the problem throughout many years. "Thus the chemical substance predominating in the soil is scarcely ever and perhaps never a cause of exclusion for any one species; but in each locality, in every country, the physical qualities of mineral substances combined with the existence of a certain climate will occasionally exclude a small number of plants from such or such kind of soil."¹

"The definite opinion expressed by De Candolle—after seven years' wanderings in France—that every plant can grow in every kind of soil, has also been verified by me after three years' wanderings in nearer Asia."²

In 1849 Jules Thurmann published the result of his studies on the vegetation of the Jura. His theories, which have been the principal source of inspiration for many later workers, can be summarized as follows:

It is the physical structure of the soil that regulates the distribution of species.

Upon this structure depend the amount of water and the thermal conditions in the soil.

The same species can grow on very different kinds of soil, if it encounters the same conditions of moisture.

Thurmann discussed the different weathering properties of various rocks under the action of air, water, heat, and cold, and he created an exact classification and nomenclature for the several types of soil having different physical qualities. Rocks very resistant to weathering he called *dysgeogenous*; those freely weathering, *eugeogenous*. The latter he divided into those giving as an end product sand, calling these rocks *psammogenous*; and those producing fine soil particles as clay, *pelogenous*. Intermediate types of soil he described by compound adjectives made from the roots of the terms above mentioned. Finer shades of meaning were added by use of the prefixes *per*, *hemi*, and *oligo*.

Thurmann denied the existence of any relation between the typical habitats of species, and the chemical nature of the soil, writing:

"It will seem quite evident that the principal factors of the condition of the soil (with equal latitude and altitudes), its degree of division, its depth, and amount of moisture are the principal causes of the similarity or dissimilarity of the vegetation, while the identity of chemical composition implies no identity in that regard."³

"From these particular facts as well as from general evidence, it follows evidently that the dispersion of the contrasting species is not found to be in any way directly connected with the chemical composition of the underlying rocks."³ Thurmann's definition of a calcareous rock makes clear the reason why he came to the conclusions that he did. "Calcareous rocks whether compact, oolitic, etc. . . . are made up of carbonate of lime alone, or at least the latter is decidedly predominant in them."⁴ No modern champion of the chemical theory would accept this definition of a calcareous rock or soil, or debate the question on this basis, on a definition which forces into the non-calcareous group many soils containing enough lime to support a large calcicole flora.

¹ De Candolle, Alphonse, "Géographie Botanique Raisonnée," i, 443-4 (1885).

² Wagner, Moritz, Bot. Zeit., vii, 356 (1849).

³ Thurmann, Jules, "Essai de Phytostatique," etc., i, 274 (1849).

⁴ Thurmann, Jules, l. c. i, 88 (1849).

Other students of this question have observed the obvious relation between the nature of the vegetation and the chemical content of the soil, but they have concluded that these relations were essentially inconstant.

"On the whole, the previous observations seem to uphold the opinion advanced by M. Alphonse de Candolle. I find it difficult to admit together with M. Contejean that there is a large number of calcicolous or calcifugous plants which may be utilized to define two distinct floras in every district. Such lists if they are established in one definite district, lose all their value if one wishes to apply them to another district. The chemical composition of the soil undoubtedly affects the distribution of certain species, but only in a relative and not direct manner."¹

Admittedly, the soil preferences of certain plants change in different parts of their range, but these changes are definable and caused by definite factors, and hence worthy of attention and study.

M. Bonnier says in another place: "It may be seen by the above quoted species that plants which are decidedly calcicolous in one district may become decidedly calcifugous in another; and that plants which are exclusively calcicolous or calcifugous may become indifferent elsewhere as regards the chemical nature of the soil."²

A reviewer remarked upon this: "I can scarcely believe that a plant which is distinctly calcicolous in a given area may become calcifugous in another area, as has been upheld by most reliable authors."³

As in so many other fields, Linnæus was a pioneer in the attempt to state definitely and explain the nature of the habitats of individual species:

"The early naturalists had considerably neglected the study and even the noting of the native countries of plants. Linnæus was the first to mention them in general works; he was the first to establish a rule and a method showing how to write out the floras; he was the first to carefully distinguish the habitations, that is the countries in which plants grow; and the habitats, that is to say the peculiar character of the localities in which they usually develop. It is, therefore, from Linnæus that are derived the first ideas of botanical geography."⁴

Following the lead of Linnæus many botanists began to observe the habitats, and, of course, they saw that limestone mountains had a different flora from that of the adjacent granitic ones. As early as 1789 H. F. Link published notes upon this.

"But the calcareous mountains have their special appearance and a character quite peculiar and different from that of other mountains, so that it generally happens that certain plants belong exclusively to calcareous rock, even if this be overlain by a thick stratum, and are but rarely found on other mountains."⁵

From the time of Link many botanists have accumulated data concerning the control of the chemical nature of the soil over plant distribution and able ones have upheld their contention against the champions

¹ Bonnier, G., Bull. Soc. Bot. France, xxvi, 341 (1879).

² Ibid. 340 (1879).

³ Gillot, F. X., Bull. Soc. Bot. France, xli, p. xxxi (1894).

⁴ De Candolle, A., Dict. des Sci. Nat., xviii, 359 (1820).

⁵ Link, H. F., "Flora Goettingensis," pp. 299-336 (1789).

of the "physical theory." Only a few of the former can be mentioned here: Lachmann, de Brebisson, de Caumont, Unger, Contejean, Bogenhard, Godron, Saint-Lager, Sendtner, Magnin, Lecoq, Hilgard, Fernald, Butters, and Wherry.

It is noticeable that none of these advocates of the "chemical theory" rejects the argument that the physical qualities of the soil are factors in determining the distribution of the species of plants. Such quotations as follow are typical and could be multiplied indefinitely.

"It must then be admitted that there is, outside of the physical influence of the soil another one which often becomes more active, that which depends upon its chemical composition."¹

"The influence of the soil upon the plant is always at once a physical and chemical one, i.e., that the soil operates upon the plant as much through its chemical constituents as through its physical nature."²

"It is not our object to give any exaggerated importance to the chemical influence, but we feel that it should be attributed a part at least equal to that of physical action, and that in spite of the numerous exceptions which occur in practical observation, it should be noted that such exceptions are just as frequent when investigations are made in connexion with the physical influence."³

Very early it was recognized that the important thing so far as the plant was concerned was the mineralogical nature of a rock, not its geological age. As early as 1828 de Caumont wrote: "I found that the mineralogical character of the soils and not their age affects the distribution of plants."⁴

Fr. Unger in 1836 saw that some plants were constant in their occurrence on a definite soil; others usually grew there, the absolute and the preferential calcicoles, for instance, and finally a third class which grew with equal readiness anywhere—the indifferent plants. He defined these classes and named them.

"On that account we divide all plants into three classes: the first of which includes the plants which belong exclusively to this or that kind of soil; the second comprises such plants as belong not solely to one kind of soil but that prefer one special soil to all others; the third includes all the rest of the plants which appear not to be at all confined within certain kinds of soil. The first we call plants persistently of one soil, the second are plants agreeable to one soil; the third belonging vaguely to this or that soil. The first class is the least numerous, the second comprises a much larger amount, the third, finally, has by far the greatest number of plants."⁵

Only in the case of the chasmophytes is it safe to assume that the chemical nature of the rock, strictly speaking, has a direct bearing on the species of plants. In the other cases the roots of plants come in contact, in most cases, only with the broken and weathered fragments forming the overlying soil. Hence, regardless of the nature of the rock, it is the nature of the soil that is of importance. That these two—the rock and the soil—are not always similar in nature was early recognized by Link when he wrote:

¹ Godron, D. A., "Essai sur la Géogr. Bot. de la Lorraine," 181 (1862).

² Trautschold, H., Bull. Soc. Imp. Nat. Moscow, xxxi, 392 (1858).

³ Lecoq, H., "Etudes sur la Géogr. Bot. de l'Europe," ii, 146 (1854).

⁴ de Caumont, A., Mem. Soc. Linn. Normandie, iv, 118 (1828).

⁵ Unger, Fr., "Ueber den Einfluss des Bodens auf die Verteilung der Gewächse nachgewiesen in der Vegetation des nordöstlichen Tirols," 163 (1836).

"If indeed the layer of earth increased so much that the roots of the plants were not limited by the stones, but could freely rove about, the distinction between a calcareous soil and a sandy one vanishes more and more, especially in case the stones are so hard that their particles cannot be mixed up with the soil."¹

This subject has recently been investigated from a modern point of view and with the more advanced technical methods of the present day by E. T. Wherry. He used the walking fern *Camptosorus rhizophyllus* as his index and endeavoured to find it growing in as many different sorts of habitats as possible. In this he was unusually successful, finding it on everything from a limestone to a gnessoid granite or a hemlock stump. In each case he made a chemical analysis of some of the actual substratum in which the roots of the fern were growing. Wherry's conclusions are that, "if a calcareous soil is defined as one containing more lime than the average field soil (0.8 per cent or less), then the soils supporting the growth of walking fern are certainly highly calcareous." This was so, even in the case of the particular granite, and hemlock stump upon which he found specimens growing. "Summary. . . . It has been shown by chemical analysis that the rocks supporting the growth of walking fern (*Camptosorus rhizophyllus*) are by no means necessarily calcareous, but that the soils in which this fern grows are rather high in both total and soluble lime. Rocks high in lime suffer leaching during soil formation, and those low in this constituent gain it through decay of vegetable matter, the ultimate amount varying widely with the conditions, but averaging about 4 per cent."²

These differences in soil are accurately represented by the change in vegetation. On the boggy summits of Mingan islands are many oxylophytes not occurring on the wooded hillsides or on the limestone cliffs by the sea or, in fact, on any other part of the islands. These high central parts of the islands have been constantly subject to leaching, hence most of the available lime has been dissolved by the carbonated water which seeps down through the humus. Owing to the nature of the drainage the soluble salts are removed to the lower slopes and are not concentrated near any of these high bogs. This is the explanation of the presence in these bogs of an oxylophytic flora.

The eminent soil chemist, the late Professor E. W. Hilgard, wrote in his chapter on the "Recognition of the character of soils from their native vegetation": "In all, or nearly all cases, it is tacitly assumed that the underlying geological formation has essentially been the source of the soil, and that its character is determined accordingly. But this assumption is wholly arbitrary unless confirmed by actual direct examination. A soil-formation overlying limestone on the slopes of a range may be wholly derived from non-calcareous formations lying at a higher elevation, or may have been leached of its original lime-content by abundant rains."³

Because of this ever present possibility that the soil in a given place will be different chemically from the underlying rock, data as to what plants grow on special soils must be collected with the greatest care. The chance for error is so considerable that it may very well explain some of

¹ Link, H. F., "Fl. Goettingensis," 334 (1789).

² Wherry, E. T., Jour. Wash. Acad. Sci., vi, 678-9 (1916).

³ Hilgard, E. W., "Soils," 523-4 (1907).

the contradictory results reached by different observers. *Saxifraga Aizoon* was found growing upon granite on mount St. Gothard,¹ and this record has been widely cited as a proof that the supposed relation between the so-called calcicoles and the presence of lime in the soil was a myth. In Saguenay county *Saxifraga Aizoon* is known to occur in only two areas: the limestone sea-cliffs and talus slopes of Mingan islands; and on one ledge of crystalline rock of not more than 200 square feet exposure, near the summit of the great peninsula forming the western side of baie des Moutons. Although this ledge appeared to be "granite," it was conspicuously different from the surrounding granites and gneisses by containing frequent large crystals of pink feldspar, and in weathering very easily. A fragment from this ledge was submitted for analysis to Mr. Thorndike Saville, who reported it to be perthitic syenite. The chemical composition, as deduced from the above percentages of minerals is, very roughly, as follows:

	Per cent
Silica.....	57
Lime.....	8
Alumina.....	13
Soda.....	3
Potash.....	14
Ferric oxide.....	3
Magnesia.....	2
	<hr/> 100

The relatively large proportion of lime explains why *Saxifraga Aizoon* was found growing on an intrusive rock at baie des Moutons, 200 miles from Mingan islands. Results like this make one sceptical as to the chemical nature of the "granite" of mount St. Gothard on which the *Saxifraga* was found growing.

In reference to similar cases of alleged discrepancies in the distribution of typical calcicoles Hilgard remarked: "The feldspars constituting rocks designated as granite, may or may not be partly or wholly of the soda-lime instead of the potash series; the mica may or may not be partly replaced by hornblende, in which cases the soil would be calcareous to the extent of determining the character of the flora as calcifuge or calciphile, without its being at all evident in the physical character of the soil, which would still be 'granitic' or 'siliceous.' Such observations in order to be critically decisive, clearly require that the observer should be not merely a systematic botanist, nor a mere geologist or chemist, but all these combined. There is good reason to believe that most or all of these supposed contradictions would disappear before a critical physical and chemical examination of both the soils and the rocks from which they are supposed to have been derived."²

A source of lime available to the plants which is not often considered, is the sea.

"The lime salts which are indispensable to many of the plants, favourable to most of them, are provided by the sea itself on the coast which it bathes, either directly or indirectly."³

¹Thurmann, J., "Essai de Phytostatique," i, 352 (1849): and Contejean, C., Ann. Sci. Nat. 5 ser., xx. 267-8 (1874).

²Hilgard, E. W., "Soils," 524 (1907).

³Gubler, A., Bull. Soc. Bot. France, viii, 442 (1861).

"In districts where limestone rocks are absent, calcicole plants may find a congenial home on maritime sands of which comminuted shells form a proportion."¹

The occurrence of *Botrychium Lunaria* along the north shore of the gulf of St. Lawrence illustrates this doctrine that the shores of the sea often contain enough lime to support calcicoles. Records giving the habitat show it to come from the two considerable limestone areas and from the top of the strand at one intervening place, pointe au Maurier.

The influence of lime on vegetation has been discussed more frequently than many of the points just considered. More than a century ago Saussure wrote:

"As one passes from the calcareous to the granitic mountains one is struck with amazement at the different influences which these two soils have on vegetation. The calcareous soil seems to excel the granitic, not merely in that greater variety of plants which it supports, but also in that state of vigour and of prosperity which they are found to have."²

And somewhat later says Von Mohl: "From both these enumerations it is made equally plain that the calcareous soil exerts a very favourable influence on the richness of the flora, in so far as both the absolute and the preferential calcicoles make up a larger quantity than the plants which are either always or usually confined to the primitive rocks."³

In a semi-popular account of Wales, Professor A. H. Graves has recently stated that: "In general the acid igneous rocks support little plant growth, while the areas containing limestone are well watered and rich in vegetation."⁴

In describing the upper reaches of Moisie river, which enters the gulf slightly east of Seven Islands—the region here specially considered—H. Y. Hind made a statement pertinent in this connexion:

"The soil where trees grew was always shallow as far as observed; and although a very luxuriant vegetation existed in secluded valleys, yet it appeared to depend upon the presence of labradorite-rock or a very coarse gneissoid rock, in which flesh-coloured feldspar was the prevailing ingredient."⁵ This description of the latter rock strongly suggests the rock which forms the ledge at baie des Moutons which supports *Saxifraga aizoon* referred to above.

Agricultural experiments have produced some of the strongest arguments for the increased productiveness due to lime in the soil. Hilgard, writing of virgin lands, says, "When we investigate the cases of such lands, it soon becomes apparent that besides the low percentage of any one ingredient, the proportions of others present require consideration. Among these, lime, in the form of carbonate, stands foremost. Its presence exerts a dominant and beneficial influence in many respects, as is readily apparent from the prompt change in vegetation whenever it is introduced into soils deficient in it." . . . "in general, we find that lower percentages of potash, phosphoric acid, and nitrogen are adequate, when a large proportion of lime carbonate is present."⁶

¹ Praeger, R. L., Proc. Royal Irish Acad., vii, xxviii (1901).

² Saussure, N. T., Journ. de Phys., li, 10 (1800).

³ von Mohl, H., Vermischte Schriften, 427 (1845), this particular article written in 1838.

⁴ Graves, A. H., Mem. N. Y. Bot. Gard., vi, 167-8 (1916).

⁵ Hind, H. Y., Can. Nat. new ser., i, 302 (1864).

⁶ Hilgard, E. W., "Soils," 353-4 (1907).

Of the various phases of this subject, one of the most interesting is that, as shown by trustworthy records, a species does not necessarily have the same soil preferences throughout its range.

"Many plants growing in certain floral districts on a particular soil present in warmer or colder districts conditions of subsoil entirely different."¹

"The same species in different climatic circumstances make different demands on the subsoil. Many continental species, which in the south-eastern lowlands are independent of the nature of the subjacent rock, and grow indifferently on limestone, gneiss, granite, etc., are, in the western, northern, and higher regions, bound to the limestone, doubtless because it is dry and warm, for which reason also many species have their most northern limit on limestone."²

Here is a field of work which can be approached from the observational viewpoint, or by exact experiment, this study of the exact soil requirements of species throughout their range. It is a meeting point of taxonomy, physiology, and geology and it promises large and very fundamental results.

As giving added weight to the determination of whether or not certain species are calcicole, it is well to quote the conclusion published toward the end of a long life of intensive study of soil chemistry by Hilgard: "What is a calcareous soil? The definition adopted for this volume" . . . is, "that a soil must be considered calcareous so soon as it naturally supports a calciphile flora—the 'lime vegetation' so often referred to above and named in detail. Upon this basis it has been seen that some (sandy) soils containing only a little over one-tenth of one per cent of lime show all the characters and advantages of calcareous soils; whereas in the case of heavy clay soils, as has been shown, the lime-percentage must rise to over one-half per cent to produce native lime growth."³

One more quotation is given to show that these relations between the distribution of the plants and the chemical nature of the soil are not confined to the vascular plants.

"It is a dogma accepted by all lichenologists from Acharius and Fries down to Koerber and Nylander that the saxicolous lichens are almost invariably all attached either on siliceous rocks or on calcareous rocks."⁴

It should be clear, from the foregoing analysis of the natural distribution of the plants of Saguenay county, and from the numerous quotations from workers in other regions, that, although the relation between the nature of the soil and the distribution of plants may differ in kind and degree for each species and although the physical properties of the soil are fundamental in determining the characteristics of special habitats, the broad distribution of plants over similar climatic zones is chiefly controlled by the chemical constituents of the soil.

¹ Drude, O., "Manuel de Géographie Botanique," 43 (1897).

² Blytt, A., "Essay on the immigration of the Norwegian flora during alternating rainy and dry periods," 34-5 (1876).

³ Hilgard, E. W., "Soils," 524 (1907).

⁴ Magnin, A., Ann. Soc. Agric. Lyon, ii, 139 (1880).

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EXPLANATION OF ABBREVIATIONS

Notation used in the citation of specimens in the taxonomic revisions and the following annotated list of species to indicate the herbarium in which the plant may be found.

C. = Canadian National Herbarium, Ottawa.

(H) = Gray Herbarium, Harvard University.

(N) = New York Botanical Garden.

(P) = Academy of Natural Sciences of Philadelphia.

(R) = Rocky Mountain Herbarium, University of Wyoming.

(Q) = Musée Scolaire, Département de l'Instruction Publique, Quebec.

(U) = United States National Museum.

(Y) = Eaton Herbarium, Yale University.

TAXONOMIC REVISIONS

EQUISETUM

EQUISETUM PALUSTRE L., var. **nigridens** n. var. Rhizoma supra ramosum; caulibus pluribus 1-4 dm. altis 1-2.5 mm. crassis 6-sulcatis, ramis infecundis lateralibus plerumque fecundos superantibus, 6-sulcatis; dentibus vaginarum marginisque angusti-membranaceis nigris.

Rootstock branching near summit: stems several, 1-4 dm. high, 1-2.5 mm. thick, 6-angled, sterile lateral branches usually overtopping the fertile; teeth of sheaths and their narrow membranaceous margin black.

Known only from Quebec: muddy edge of pool in tundra, Romaine, Lagorgendière, July 8, 1915, Harold St. John (C. No. 90,034, type). The variety differs from the species as known in adjacent as well as distant regions, in having the membranaceous margins of the teeth suffused with dark, colouring matter.

ALOPECURUS

ALOPECURUS ARISTULATUS Michx., var. **Merriami** (Beal) n. comb. *A. Howellii* Vasey, var. *Merrimani* Beal¹. Grasses of N. America, ii, 278 (1896). Through the kindness of Prof. A. S. Hitchcock, the writer has been enabled to examine a part of the type of this variety. It has a short, not-twisted awn, attached near the middle of the lemma and not exerted beyond the glumes. As in this and all other specific characters, the variety agrees with *A. aristulatus* Michx., the new combination is made under that species. In *A. aristulatus* the spikelets are straw-coloured, or, when fresh, tinged with green. In the variety *Merriami*, the spikelets are violet-tinted, the plant is more dwarfed in habit, the spikes are shorter, and the leaf sheaths are shorter and more inflated.

From its very brief description² *A. fulvus* Smith, forma *violacea* Hackel would seem to be identical with *A. aristulatus* Michx., var. *Merriami* (Beal) St. John. The diagnosis is simply, "Differt a typo spiculis violascentibus." As it has been fully demonstrated³ that *A. fulvus* Smith must

¹ Erroneously credited to, and described in honour of, Dr. C. H. Merriman, instead of to Dr. C. Hart Merriam.

² Dusen, P., "Svenska Exped. Till Magellansländerna," iii, 218 (1900).

³ Simmons, H. G., Arkiv För Botanik, vi, No. 17, 2 (1907): and St. John, H., Rhodora, xix, 165 (1917).

be treated as a synonym of *A. aristulatus* Michx., the two variants *Merriami* and *violacea* seem to be identical. To test this, the writer sent an authentic specimen of the var. *Merriami* (part of the collection from Quebec cited below) to Upsala, where it was compared by Dr. H. O. Juel, Director of the Botanical Museum, with the type specimen of forma *violacea*. He reports: "In your specimen the glumæ are more hairy on the surfaces, and the bristles on their edges are more prominent; also the spiculæ are somewhat shorter than in the specimen of *A. fulvus*, f. *violaceus*." We must, consequently, consider the forma *violacea* from southern Patagonia as distinct from the boreal var. *Merriami*. This is known only from the more northern and alpine limits of the range of the species.

Iceland: Grenjadarstad, July 6, 1895, Miss Elizabeth Taylor. Greenland: Frederiksdal, August 1, 1889, D. E. Lundholm; northern Greenland, Sakkak, 1870, Berggren, and July 18, 1871, T. M. Fries. Quebec: sprawling on sandy pond shore, anse des Dunes, Brest, July 31, 1915, Harold St. John, C. No. 90,117. Saskatchewan: 1858, E. Bourgeau. Colorado: below Hebron, altitude 9,000 feet, North Platte river, August 19, 1898, C. L. Shear and Bessey, No. 1,502; Dead lake, altitude 3,500 m., August 14, 1901, F., E., and E. S. Clements. Herbaria Formationum Coloradensium, No. 464. Oregon: low ground, Dalles, April 12, 1903, J. Lunell, No. 6; Rowena, May 11, 1899, A. B. Leckenby. Washington: bottom lands of Columbia river, western Klickitat county, May 11, 1892; W. N. Suksdorf, No. 1,066. Alaska: St. Paul island, July 25, 1897, J. M. Macoun, C. No. 16,636; St. George island, August 10, 1891, C. H. Merriam (TYPE).

POA

POA ALPINA L., var. ***Bivonæ*** (Parl.), n. comb. *P. Bivonæ* Parl. in Gussone, Fl. Sic., i, 99 (1842); *P. insularis* Parl. b. *Bivonæ* Parl., Parl. Fl. Italiana, i, 342 (1850); *P. alpina* L. β . *insularis* (Parl.) Fiori b. *Bivonæ* (Parl.) Fiori, Fiori e Paoletti, Fl. An. Ital., i, 85 (1896-8).

A plant of wet calcareous rocks of Newfoundland, and Mingan islands is inseparable from *P. Bivonæ* Parl. described from the mountains of Sicily. Both are obviously an extreme of the widely dispersed *P. alpina* L., differing in having the spikelets yellowish or greenish in colour, not bordered with purple; the lemmas with a broader hyaline margin; the panicle much fuller, bearing 50 to 125 spikelets; the plant densely caespitose, of much more luxuriant growth, culm leafy to the summit; and the leaves often much overtopping the panicle. The extreme specimens are strikingly distinct from *P. alpina* L., but several intermediate specimens at hand lead the writer to treat *P. Bivonæ* as a variety of that species.

Newfoundland: brookside and damp bushy ravines on the limestone tableland, altitude 200 to 300 m., Table mountain, region of Port à Port bay, July 16 and 17, 1914, M. L. Fernald and H. St. John, No. 10,785 (H). Quebec: limestone sea-cliffs, Eskimo island, June 29, 1915, Harold St. John (C. No. 90,802). Material intermediate between *P. alpina* and the var. *Bivonæ* has been seen from Quebec: limestone sea-cliffs, Eskimo island, June 29, 1915, Harold St. John (C. No. 90,803). Colorado: Little Kate mine, La Plata mountains, altitude 11,500 feet, C. F. Baker, F. S. Earle, and S. M. Tracy, No. 928 (H).

SALIX VESTITA AND ITS VARIETIES

BY M. L. FERNALD AND H. ST. JOHN

Salix vestita Pursh, as its author justly said, is "a very elegant species," but like so many species of willows, it shows a considerable range of variation. This has been studied by the writers and the results affecting the North American plant are embodied in the following key:

A. Capsules narrowly ovoid, definitely tapering to the blunt tip; pistillate catkin 0.5–3 cm. long; staminate catkin 0.6–2 cm. long; leaves obovate or orbicular, usually somewhat retuse and reticulately veined.

B. Leaves permanently clothed beneath with soft, white, silky pubescence; staminate catkin 1–1.5 cm. long; winter buds pubescent at least at the tip.

1. *Salix vestita* Pursh.

B'. Leaves nearly glabrate beneath, a few hairs persisting on the veins, even the young leaves only sparsely clothed; staminate catkin 1.7–2.5 cm. long; winter buds quickly glabrate and lustrous.

2. *S. vestita*, var. *psilophylla* Fernald and St. John.

A'. Capsules only slightly tapering to the broad rounded summit; pistillate catkin 2–5 cm. long; staminate catkin 1–3 cm. long; leaves elliptical or oblong, often subacute, usually plane above.

3. *S. vestita*, var. *erecta* Anderss.

1. *SALIX VESTITA* Pursh, Fl. Am. Sept., ii, 610 (1816); *S. reticulata* L., var. *vestita* (Pursh) Anderss. Öfvers. K. Vet. Akad. Förh. (Nordamerik. pilarter, Salices) 133 (1858). Trunks stout, depressed or subascending, rarely 1 m. high, in exposed situations somewhat matted; leaves 1.5–8 cm. long, 0.8–6.5 cm. broad. Limestone ledges and shingle from northern Labrador and Ungava to northern and western Newfoundland, Mingan islands, Anticosti island, and Gaspé peninsula, Que. The record of this species from Altai mountains, Siberia, was presumably based upon specimens of *S. reticulata* L., var. *villosa* Trautv. in Ledeb. Fl. Alt., iv, 291 (1833) and later renamed by Andersson *S. vestita*, α . *humilior* in DC. Prodr., xvi, sec. 2, 300 (1868). At least the material from this region collected by Bunge and distributed as *S. vestita* is *S. reticulata*, var. *villosa*, not *S. vestita*. There are reports of the species from Europe, but the authors have seen no material.

2. *S. VESTITA* Pursh, var. ***psilophylla***, Fernald and St. John, n. var., foliis tenuibus subtus pallidis glabrescentibusque supra rugosis obovatis vel ellipticis 3–5.5 cm. longis, 1.7–4.7 cm. latis; amentis masculis 1.7–2.5 cm. longis; amentis femineis (immaturis) 2–3 cm. longis, floribus basin versus sparsis; squamis gemmarum fulvis, glabris lucidisque; aliter formæ typicæ similibus.

Leaves thin, pale, and glabrescent beneath, slightly rugose above, obovate to elliptic, 3–5.5 cm. long, 1.7–4.7 cm. broad; staminate catkins 1.7–2.5 cm. long; pistillate catkins (immature) 2–3 cm. long, loosely flowered at base; scales of the winter buds fulvous, glabrous and lustrous; otherwise as in the typical form. Quebec: limestone sea-cliffs, Eskimo island, June 28, 1915, Harold St. John (C. No. 90,378, type in Hb. Geol. Surv., Can.). This may prove to be *S. reticulata* L., α *vestita-grandifolia* Anderss.,¹ but this plant was described with "amentis fere bipollicaribus" and came, at least in part, from Siberia.

¹ Andersson, Öfvers. K. Vet.-Akad. Förh., 133 (1858).

3. *S. VESTITA* Pursh, var. *ERECTA* Anderss. in DC. Prodr., xvi, pt. 2, 300 (1864); *S. Fernaldii* Blankinship, Mont. Agric. Coll. Sci. Studies, Botany, i, 46-7 (1905). Erect or decumbent; leaves elliptical or oblong, 2-7 cm. long, 1-4 cm. broad, silky beneath, plane or obscurely reticulated above. Keewatin and in the mountains of British Columbia, Montana, and eastern Oregon. Exceptional specimens from British Columbia with suborbicular leaves, but with long staminate aments, connect this variety with typical *S. vestita*, as do occasional eastern shrubs with elliptical leaves.

REVISION OF CERTAIN NORTH AMERICAN SPECIES OF *ANDROSACE*

Knuth's recent monograph of the genus *Androsace*¹ presents a consistent treatment of the North American species. However, a study of the type specimens, or in a few cases, of photographs of them, and of a series of about six hundred sheets of *A. septentrionalis*, *A. occidentalis*, and their allies, has caused the author to draw different conclusions, in certain cases, as to their specific rank or their correct names.

Since 1896 there has been a marked activity by several American botanists in describing new species in this genus. Some have characterized as new species plants barely in flower and with the pedicels as yet unexpanded, plants so young that their future development as to length of scape or pedicels, position of pedicels, shape and size of calyx and capsule, can only be surmised. It is work of this sort that has created such great confusion in the treatment of this genus.

All the species here considered are annuals or winter annuals and respond easily to any unusual conditions of growth. Consequently a good deal of variation must be expected, and when found not taken too seriously.

The following key presents the species and their varieties with their diagnostic characters, as understood by the writer.

A. Bracts linear.

B. Scapes few, one or occasionally more, strongly developed, up to 25 cm. in length, strictly erect; pedicels slender, numerous, 15-35 on a well-developed scape; the central ones straight and ascending; the lateral arched-ascending.

C. Pedicels not glandular.

1. *A. septentrionalis* L.

C'. Pedicels bearing dark stipitate glands.

1a. *A. sept.*, var. *glandulosa* (Wootton and Standley) St. John.

B'. Scapes numerous, many of them of nearly equal development; pedicels often heavier and less numerous, many of them divergent.

D. Scapes five or more times the length of the pedicels.

1b. *A. sept.*, var. *robusta* St. John.

D'. Scapes three times the length of, or exceeded by, the pedicels.

E. Scapes 10-25 cm. in height, about twice the length of the slender, flexuous, widely spreading, often very numerous pedicels; plants pale green.

1c. *A. sept.*, var. *subulifera* Gray.

¹ Engler's Pflanzenreich, iv, Fam. 237, 172-220 (1905).

- E'. Scapes less than 10 cm. in height, or if slightly exceeding this, the scapes more than twice the length of the pedicels; plants dark green or reddish.
- F. Not dwarfed alpine varieties; scapes 5 cm. or more in height; pedicels numerous.
- G. Calyx-lobes and base of calyx-tube nearly glabrate.
- 1d. *A. sept.*, var. *diffusa* (Small) R. Knuth.
- G'. Calyx-lobes and base of calyx-tube densely clothed with short stellate hairs.
- 1e. *A. sept.*, var. *puberulenta* (Rydb.) R. Knuth.
- F'. Dwarfed alpine variety; scapes not over 2 or 3 cm. in height; pedicels few (1-6), short and stout.
- 1 f. *A. sept.*, var. *subumbellata* A. Nels.
- A'. Bracts lanceolate or broader.
- H. Bracts broadly lanceolate to elliptical; calyx-lobes conspicuously green and foliaceous, contrasting vividly with the pale scarious calyx-tube.
- I. Calyx-lobes erect or slightly divergent.
- J. Calyx-lobes large, deltoid or broadly lanceolate.
2. *A. occidentalis* Pursh.
- J'. Calyx-lobes narrowly deltoid or subulate.
- 2a. *A. occid.*, var. *simplex* (Rydb.) St. John.
- I'. Calyx-lobes recurved, arching; a sprawling variety with filiform scapes and peduncles.
- 2b. *A. occid.*, var. *arizonica* (Gray) St. John.
- H'. Bracts ovate-lanceolate, with a sharp attenuate caudate tip; pedicels few (3-7), stiffly ascending or divergent, but never reflexed; calyx-lobes stiff, narrowly deltoid.
3. *A. acuta* Greene.

1. ANDROSACE SEPTENTRIONALIS L., Sp. Pl. i, 142 (1753). *A. arguta* Greene, Pittonia, iv, 148 (1900). *A. Gormanii* Greene, Pittonia, iv, 149 (1900). *A. septentrionalis* L., var. *Gormannii* (Greene) Ostenfeld, Vidensk. Selsk. Skr. Mathem.—Naturv. Kl. No. 8, 61, and fig. 21 (1910). Leaves in a close basal rosette, linear-lanceolate, irregularly toothed or entire, 1-3 cm. long, 0.2-0.6 cm. wide, the margins and the upper surface covered with a coat of short, stiff, stellate hairs; scapes few, one or more strongly developed, up to 25 cm. in length, strictly erect, scabrous at first with stellate hairs; pedicels quickly glabrate, slender, numerous (15-35 on a well-developed scape), 2-5 cm. long; the central ones straight and upright; the lateral ones arched-ascending, forming a close umbel suggesting that of an *Allium*; calyx-tube campanulate, scarious and straw-coloured or sometimes greenish, longer than the calyx-teeth; corolla white or pink, exceeded by the sepals; capsule globular; the valves exceeding the calyx-lobes. Widely distributed in boreal or arctic habitats in Eurasia and the Arctic archipelago, and from Mingan islands and James bay to Alaska and south to the mountains of New Mexico. Quebec: île Ste. Geneviève, July 20, 1882, D. N. Saint-Cyr (Q). Ontario: mouth of Albany river, James bay, July 25, 1904, W. Spreadborough (C. No. 62,558); Fort Severn, James bay, August 8, 1886, J. M. Macoun (C. No. 15,866). Alberta: Lower Bow flats, Banff, July 1, 1891, J. Macoun (C. No. 15,858); sandy plains, Banff, altitude 4,500 feet, May 27-July 13, 1899, W. C. McCalla, No. 2,424 (U); Bow valley, Banff, June 9-18, Stewardson Brown, No. 54 (P). Morley, June 17, 1885, J. Macoun (C). British Columbia: western summit of North Kootenay pass, July 26, 1883, Dawson (C. No. 15,865); Telegraph creek, latitude 58 degrees, May 27, 1887, Dawson (C. No. 15,864). Yukon: dry gravelly soil and old river benches, Selkirk,

May 23, 1899, M. W. Gorman, No. 981 (type of *A. Gormanii* Greene) (C. and U.); growing on dry gravel banks, lake Bennett, June 5, 1899, J. B. Tarleton, No. 8 (U); near Dawson, July 12, 1902, J. Macoun (C. No. 91,226). Alaska: along Klutina river, one mile above mouth, May 28, 1902, W. L. Poto, No. 8 (U); in open ground at Rampart House, Upper Porcupine river, June 14, 1894, Frederick Funston, No. 177 (U). New Mexico: Nutritas creek, below Tierra Amarilla, Rio Arriba county, 2,240 m., April 18–May 25, 1911, W. W. Eggleston, No. 6, 497 (U).

The plants that match the Eurasian specimens of *A. septentrionalis* L. are decidedly uncommon in North America, as can be seen from the preceding citation of specimens. Dr. Greene published¹ a statement of his opinion concerning the "real Old World *A. septentrionalis* (not believed by the author to exist in this country)." He did not give any reasons for his belief and to the author the identity of such North American plants as those cited with typical Eurasian plants seems so perfect as to leave no reasonable doubt.

In the same paper² Dr. Greene described as new species two plants, both very young and collected at far northern stations:

A. arguta Greene is based on a plant from Port Clarence, Bering straits, June 28, 1890, W. G. Hay. This has upright, well-developed scapes, more numerous than usual; the pedicels are unexpanded, causing the inflorescence to appear like a head; but this is well matched by sheets of typical *A. septentrionalis* from nearby Alaskan stations.

A. Gormanii Greene is likewise based on young plants of *A. septentrionalis*, in which the pedicels are as yet unexpanded. The type specimen is from dry, gravelly soil and old river benches, Selkirk, Yukon, May 24, 1899, M. W. Gorman.

1a. *A. SEPTENTRIONALIS* L., var. ***glandulosa*** (Wooton and Standley) n. comb. *A. glandulosa* Wooton and Standley, Bull. Torrey Bot. Cl. xxxiv, 519 (1907). Exactly resembling *A. septentrionalis* in habit, and differing only in having more abundant persistent stellate hairs on the scape, and on the upper part of the scape and pedicels numerous dark glandular hairs. Known only from the mountains of Colorado, Arizona, and New Mexico. Colorado: latitude 40-41 degrees, Rocky mountains, Powell's Colorado Exploring Expedition, 1868, Geo. Vasey, No. 376 A (H); mountain sides near Georgetown, altitude 8,000-10,000 feet, July and August, 1885, H. N. Patterson, No. 98, in part (H); Paiute pass, July 22, 1872, Thos. C. Porter (U No. 236,041). Arizona: Flagstaff, altitude 7,000 feet, June 24, 1898, Dr. D. T. MacDougal (H and P and R and U); Flagstaff, May–October, 1900, C. A. Purpus, No. 8,052 (U); Fort valley, Coconino National forest, July 3, 1909, G. A. Pearson, No. 206 (U); White mountains, August 11–15, 1903, David Griffiths, No. 5,287 (U); open flats, Alpine, July 31, 1912, L. N. Goodding, No. 1,260 (U). New Mexico: Middle fork of the Gila, Mogollon mountains, Socorro county, August 5, 1900, E. O. Wooton (TYPE, U No. 738,347); Raton, June 10, 1887, Tracy and Evans (U No. 724,540).

¹ Pittonia, iv, 150 (1900).

² E. L. Greene, Pittonia, i. c.

1b. *A. SEPTENTRIONALIS* L., var. **robusta** n. var. Caulibus nullis, radice valde fibrosa; foliis rosulatis linearibus vel lanceolatis vel subspatulatis edenticulatis vel maximis ad apicem grosse inaequaliterque denticulatis 0.4–4 cm. longis, 1–6 mm. latis, subter glabris, aliquis partis cum pilis brevibus stellatisque scabratis, petiolo alato: scapis pluribus cum pilis brevibus stellatisque scabratis celeriter supra glabratis 18 cm. altis 5–15 (sæpissime ca. 9)-floribus divergentibus vel subdecumbentibus 5-plus plo. longioribus quam pedicellis; bracteis linearibus 1–4 mm. longis; pedicellis robustis usque ad 4 cm. longitudine saepe valde divaricatis mox glabratis; campanulati tubo calycis lacinias 5 breves virides late deltoides superanti; corolla et capsula lacinias calycis superanti.

Plant acaulescent, springing from a fibrous tap-root; the leaves borne in a basal rosette, linear or lanceolate or nearly spatulate, nearly entire or the larger coarsely and irregularly toothed towards the apex, 0.4–4 cm. long, 1–6 mm. wide, with a broadly winged petiole, glabrous beneath, elsewhere scabrous with short stellate hairs: scapes several, of nearly equal development, at first scabrous with short stellate hairs, but soon glabrate above, 18 cm. high; the lateral ones often nearly decumbent: bracts linear, 1–4 mm. long: pedicels stout, up to 4 cm. in length, 5–15 (averaging 9) in number, commonly strongly divergent, early glabrate: calyx-tube campanulate, exceeding the five short, green, broadly deltoid lobes: corolla and capsule definitely exceeding the calyx-lobes. Calcareous ledges and beaches, Mingan islands, the west coast of Hudson bay and Bernard harbour, west of Coronation gulf. Quebec: limestone sea-cliffs, Eskimo island, June 29, 1915, Harold St. John (C. No. 90,815); top of limestone shingle, île Ste. Geneviève, July 1, 1915, Harold St. John (C. No. 90,814) (TYPE). Keewatin: Churchill, Hudson bay, latitude 58° 51'; August 5, 1910, J. M. Macoun (C. No. 79,387 and H); north of cape Jones, Hudson bay, July 8, 1899, A. P. Low (C. No. 63,247 and H and U); cape Jones, Hudson bay, July 11, 1899, A. P. Low (C. No. 63,246). Mackenzie: Bernard harbour, west of Coronation gulf, July 20, and August 25, 1915, Fritz Johansen (C. Nos. 91,006 and 91,007).

1c. *A. SEPTENTRIONALIS* L., var. *SUBULIFERA* Gray, Synopt. Fl. N. Am. ii, pt. 1, 60 (1886). *A. pinetorum* Greene, Pittonia, iv, 149 (1900). *A. septentrionalis* L., var. *pinetorum* (Greene) Knuth, Engl. Pflanzenreich, iv, Fam. 237, 215 (1905). *A. subulifera* (Gray) Rydb., Bull. Torrey Cl. xxxiii, 148 (1906). Scapes tall, 10–25 cm., slender, about twice the length of the slender, flexuous, widely spreading, often very numerous pedicels: calyx-lobes long and tapering, plants pale green. Known from South Dakota, and from Saskatchewan and Yukon south in the mountains to Arizona and New Mexico. South Dakota: Rapid canyon, Black hills, August 17, 1891, T. A. Williams (U. No. 511,110). Saskatchewan: gravelly slopes, Methy (La Loche) portage, September 19, 1875, J. Macoun (C. No. 15,863); gravelly slopes, Bad hills, July 25, 1879, J. Macoun (C. No. 15,862). Yukon: peat bog, mouth of Bonanza creek, July 18, 1902, J. Macoun (C. No. 91,225). Alberta: Maligne river, Athabaska river, July 5, 1898, W. Spreadborough (C. No. 19,846); on rocks at Sulphur spring, Crowsnest pass, August 17, 1897, J. Macoun (C. No. 23,481); Elbow river, June 21, 1897 (C. No. 23,480). Montana: Cedar mountain, altitude 10,000-feet, July 16, 1897, P. A. Rydberg and Ernst A. Bessey, No. 4,679. (U). Wyo-

ming: damp soil, Teton pass, July 12, 1901, E. D. Merrill and E. N. Wilcox, No. 975 (H); Pole creek, June 28, 1895, Aven Nelson, No. 1,332 (H and U); Table mountain, June 27, 1895, Aven Nelson, No. 1,332 (R). Utah: Big Cottonwood canyon, below Silver lake, July 8, 1905, P. A. Rydberg, No. 6,815 (H); Big Cottonwood canyon, Salt Lake county, altitude 8,500 feet, July 11, 1905, A. O. Garrett, No. 1,333 (R). Uinta, altitude 8,000 feet, July, 1869, Sereno Watson, No. 752 (U). Colorado: Lake ranch, near Boulder City, June, 1874, H. G. French (type in H); Minnehaha, altitude 2,600 m., July 5, 1901, F. E. and E. S. Clements, No. 263 (H and U); Cimarron canyon, altitude 6,900 feet, June 7, 1901, C. F. Baker, No. 66 (H and U); Pennocks Mountain ranch, altitude 7,500 feet, June 14, 1896, C. S. Crandall, No. 4,144 (R and U); Los Pinos (Bayfield), May 16, 1899, C. F. Baker, No. 515 (H); Berwind, 1900, Jennie M. Archibald, No. 238 (R). Arizona: Prescott, 1876, E. Palmer, No. 617 (H). New Mexico: Las Vegas, June 24, 1891, L. H. Dewey (U No. 245,653); Albuquerque, September 4, 1884, M. E. Jones (U No. 220,168); Winsar's ranch, Pecos River National forest, altitude 8,400 feet, June 29, 1908, P. C. Standley, No. 4,015 (U).

Gray's description of this variety is brief, mentioning only the long, slender calyx-lobes. Two collections are cited: Rocky mountains, near Boulder City, Col., H. G. French, and San Bernardino, Cal., Parry and Lemmon. The former is taken as the type of this variety. It has the deeply-cut calyx and also the tall scapes and diffuse, slender pedicels taken as diagnostic in this revision. The other sheet cited, San Bernardino, Parry and Lemmon, likewise has a deeply-cut calyx and attenuate lobes, but it is a low plant with stiffly divergent pedicels and ovate-lanceolate caudate-tipped bracts. It is *A. acuta* Greene. Nothing in Gray's description indicates that either of these two plants was considered more characteristic than the other, but Greene's segregation of the latter as a species leaves only the former to stand as the representative of *A. septentrionalis* var. *subulifera*.

A. pinetorum Greene is cited here as a synonym of *A. septentrionalis*, var. *subulifera*. The original description of this was drawn from a plant from Colorado: Graham park, altitude 7,800 feet, May 12, 1899, C. F. Baker, No. 516. Greene says: "This species bears more resemblance to real Old World *A. septentrionalis* (not believed by me to exist in this country), than do any of the plants of the far west and north that have been referred to it." This sheet contains eight young plants with well-developed, upright scapes and the young pedicels only beginning to elongate. There is nothing in these type specimens or in the description to indicate any reason why they should be treated as distinct from *A. septentrionalis*. Other specimens collected by C. F. Baker the same season, determined by Dr. Greene as his new species *A. pinetorum*, and alluded to in his description, are the tall mature plants with the abundant long diffuse pedicels such as Dr. Gray's earlier name var. *subulifera* is applied to. Plants of this description are the ones that have usually in the past been called *A. pinetorum*, and on the basis of this interpretation of *A. pinetorum* it is put here as a synonym. It is evident that their correct name is var. *subulifera*.

Plants such as those from Arizona: Fort valley, Coconino National forest, and vicinity, September 4, 1909, G. A. Pearson, No. 288 (U), demonstrate the wisdom of treating these various phases as varieties rather

than as species. They have the habit, the tall scapes, and the lax spreading pedicels of *A. septentrionalis*, var. *subulifera*, but the dark glandular pubescence of the var. *glandulosa*.

1d. *A. SEPTENTRIONALIS* L., var. *DIFFUSA* (Small) R. Knuth, Engl. Pflanzenreich, iv, Fam. 237, 215 (1905). *A. diffusa* Small, Bull. Torrey Cl. xxv, 318 (1898). *Amadea diffusa* (Small) Lunell, Am. Midl. Nat., iv, 504 (1916). Scapes several, 5–10 cm. or if slightly taller the scapes more than twice the length of the pedicels, which are stiff, markedly divergent, but not often much curved; calyx-lobes and base of the calyx-tube nearly glabrate. The commonest variety, known from Saskatchewan to Alaska, and southward in the mountains; from North and South Dakota and westward to Idaho and Nevada and southward to the Mexican boundary. Saskatchewan: Carlton to Edmonton, August, 1825, Drummond (H). Alberta: Elbow river, lat. 49° 40', June–July, 1897, J. Macoun, No. 23,480 (H and U); Milk River ridge, July 18, 1895, J. Macoun (C. No. 11,778). British Columbia: northern part, Western Union Telegraph Exploring Expedition, 1865–66, J. T. Rothrock, No. 31 (U); near head of McGillivray creek, altitude 6,000 feet, Cascade mountains, August 18 and 19, 1916, J. M. Macoun (C. Nos. 91,008 and 91,009). Alaska: on gravelly flats of the Teller, Reindeer station, August 19, 1901, F. A. Walpole, No. 1,863 (U). North Dakota: Leeds, June 26, 1900, J. Lunell (H); Dunseith, August 13, 1911, E. T. Tufte, No. 224 (R). South Dakota: moist flat near Redfern, elevation 5,700 feet, Black Hills National forest, May 12, 1910, John Murdock, jun., No. 4,033 (H); Custer, altitude 5,500 feet, Black hills, June 3, 1892, P. A. Rydberg, No. 864 (U). Montana: moist places, Boulder creek, June 25, 1883, F. Lamson Scribner, No. 144 (P and H); Deep creek, August 31, 1891, R. S. Williams, No. 723 (U). Idaho: hill near Paso creek, Lost River mountains, August 15, 1895, L. F. Henderson, No. 4,018 (U); southwest corner of Franklin basin, altitude 7,500 feet, Bear River range, July 25, 1910, Charles Piper Smith, No. 2,229 (R). Wyoming: Battle lake, August 15, 1897, Aven Nelson, No. 4,151 (R); La Plata mines, August 30, 1898, Elias Nelson, No. 5,256 (R). Colorado: Los Pinos (Bayfield), May 16, 1899, C. F. Baker, No. 515 (R and U); moist swales, Hopi (Rabbit Ear) buttes, Routt county, July 17, 1903, L. N. Goodding, No. 1,570 (P and R and U). Utah: moist places, Dyer mine, Uinta mountains, July 3, 1902, L. N. Goodding, No. 1,250 (H and R and U); in protected nooks on side of mountain, Big Cottonwood canyon, altitude 8,500 feet, Salt Lake county, July 11, 1905, A. O. Garrett, No. 1,333 (H and R); Clayton peak, altitude 9,800 feet, Wasatch mountains, August 12–26, 1903, S. G. Stokes (U). New Mexico: Santa Fe canyon, altitude 8,000 feet, May 14, 1897, A. A. and E. G. Heller, No. 3,528 (H and U); near the west fork of Gila river, altitude 7,500 feet, Mogollon mountains, August 2, 1903, O. B. Metcalfe (U); in oak chaparral, vicinity of Chama, altitude 2,380–2,850 m., Rio Arriba county, July 9, 1911, P. C. Standley, No. 6,688 (U). Arizona: wet springy place, Wekersheim's cabin, Huachuca mountains, August 9, 1909, L. N. Goodding, No. 368 (H and R); Lynx creek, May 31, 1883, Henry H. Rusby, No. 5,222 (U); rolling, andesitic, recently pine-clad area, open westward, Barfoot park, altitude 8,000–8,250 feet, J. C. Blumer, No. 1,554 (U).

1e. *A. SEPTENTRIONALIS* L., var. *PUBERULENTA* (Rydb.) Knuth, Engi. Pflanzenreich, iv, Fam. 237, 216 (1905). *A. puberulenta* Rydb. Bull. Torrey Cl. XXX, 260 (1903). *Amadea puberulenta* (Rydb.) Lunell, Am. Midl. Nat., iv, 504 (1916). Resembling var. *diffusa* in all respects except that the calyx-lobes and the base of the calyx-tube are densely covered with short stellate hairs. From Manitoba to Mackenzie river, and southward in the mountains; from North Dakota westward to Montana, and southward to the Mexican border. Manitoba: on open prairie, Stonewall, June 2, 1896, J. Macoun (C. No. 12,277 and U); open prairies, Carberry, May 27, 1884, J. M. Macoun (C. No. 15,861). Saskatchewan: Palliser's Brit. N. Am. Expl. Expedition, 1858, E. Bourgeau (H); roadside, sandhills, north of Prince Albert, July 3, 1896, J. Macoun (C. No. 12,769); gravelly places and open flat prairies, Crane lake, June 15, 1894, J. Macoun (C. No. 5,319 and H). Alberta: low prairie, Calgary, June 19, 1903, M. A. Barber, No. 232 (H); altitude 4,500 feet, Banff, June 12, 1906, F. K. Butters and C. O. Rosendahl, No. 1,340 (H); Jumpingpound creek, June 14, 1897 (C. No. 23,479); sandy banks, Lesser Slave lake, June 1, 1903, J. M. Macoun (C. No. 61,246 and H and U); Chipewyan, June 4, 1903, A. E. Preble and M. Carey, No. 2 (U). North Dakota: in fields, Leeds, May 7, 1901, J. Lunell (R No. 39,241); in fields, Leeds, May 7 and 19, 1902, J. Lunell (H). South Dakota: Custer, altitude 5,500 feet, Black hills, June 3, 1892, P. A. Rydberg, No. 864 (H). Montana: Bracket creek, June 2, 1901, Burle J. Jones (H and U No. 668,421); mountain meadows, altitude 7,000 feet, Gallatin basin, Bozeman, August 5, 1905, J. W. Blankinship, ser. I, No. 337 (U); plains, Midvale, June 21, 1903, L. M. Umbach, No. 112 (U). Wyoming: rich ground, near Mammoth Hot Springs, altitude 6,200 feet, June, 1893, F. H. Burglehaus (U No. 210,508); Centennial valley, June 8, 1895, Aven Nelson, No. 1,244 (R); in dry, open place on a wooded slope, Glen creek, Yellowstone National park, A. Nelson and E. Nelson, No. 5,609 (R). Colorado: gravelly slopes, South Cottonwood gulch, altitude 10,500 feet, July 9, 1892, C. S. Sheldon, No. 503 (U); hills, Larimer county, altitude 9,500 feet, July 18, 1895; C. F. Baker, No. 6,733 (H). Utah: Alta, Wasatch mountains, altitude 10,000 feet, August 7, 1879, M. E. Jones, No. 1,206 (U); Big Cottonwood canyon, below Silver lake, June 29, 1905, P. A. Rydberg and E. C. Carlton, No. 6,500 (R). New Mexico: side of Grass mountain, altitude 9,000 feet, Pecos National forest, July 3, 1908, P. C. Standley, No. 4,141 (U); White Mountain peak, August 1, 1901, E. O. Wooton (U).

1f. *A. SEPTENTRIONALIS* L., var. *SUBUMBELLATA* A. Nelson, Bull. Wyo. Exp. Sta., xxviii, 149 (1896). *A. subumbellata* (Nels.) Small, Bull. Torrey Cl. XXV, 319 (1898). A variety of alpine habitats, with dwarfed scapes, not over 2 or 3 cm. in height: the pedicels short, stout, and few in number (1-6). From Alberta and British Columbia and south in the mountains to New Mexico, Arizona, and California. This seems to be the only variety of *A. septentrionalis* found in the Pacific tier of states. Alberta: Sulphur mountain, Banff, June 29, 1891 (C); lake Louise, July 20, 1904, J. Macoun (C. No. 68,722); Laggan (lake Louise), June 27, 1904; J. Macoun (C. No. 68,721). British Columbia: west summit of North Kootenay pass, July 26, 1883, Dawson (C. No. 15,865); Kicking Horse pass, July 20, 1885, J. Macoun (C); Cornwall hills, July 28, 1894, J. McEvoy (C. No. 7,387); McLean mountain, near Lillooet, July, 1916, J. M. Macoun

(C. No. 91,010). Montana: stony detritus, altitude 11,000 feet, Lone mountain, Bozeman, August 6, 1905, J. W. Blankinship, ser. 1, No. 340 (P and U); Old Hollowtop, altitude 9,000 feet, near Pony, July 9, 1897, P. A. Rydberg and E. A. Bessey, No. 4,680 (H); heights above Carbonate draw, altitude 8,000 feet, July 13, 1904, R. T. Shaw, No. 306 (P and H and U). Idaho: Hayden Exp., 1872 (U No. 48,670); summit of Soldier mountains, altitude 11,800 feet, July 15, 1895, L. F. Henderson, No. 3,135 (U). Washington: Rocky Mountain summits, altitude 8,000 feet, lat. 49 degrees, 1861, Dr. Lyall (H); Oregon: alpine, Wallowa mountains, 1886, W. C. Cusick (H); subalpine ridges of Wallowa mountains, near the lake, July 29, 1899, W. C. Cusick, No. 2,269 (H and U). Wyoming: Union pass, August 13, 1894, Aven Nelson, No. 998 (H and U); on the naked gravelly summits, Dunraven peak, August 27, 1899, A. Nelson and E. Nelson, No. 6,682 (H and R and U). Colorado: Carson, altitude 11,000 feet, July 2, 1901, C. F. Baker, No. 300 (H and R and U); Bear Creek divide, west of mount Hesperus, altitude 11,000 feet, June 29, 1898, C. F. Baker, F. S. Earle, and S. M. Tracy, No. 222 (H and U); Ribbon lake, altitude 3,500 m., July 25, 1901, F. E. and E. S. Clements (H and U). Utah: alpine parks, Fish lake, July 18, 1902, L. N. Goodding, No. 1,400 (H and R and U); gravelly soil, altitude 10,000–11,000 feet, La Sal mountains, May–October, 1899, C. A. Purpus, No. 7,036 (U). Nevada: East Humboldt mountains, altitude 10,000 feet, September, 1868, Sereno Watson, No. 753 (H and U). California: White mountains, altitude 13,000 feet, Mono county, July 22, 1886, W. H. Shockley, No. 452 (H); top of Grayback, altitude 11,480 feet, San Bernardino mountains, August 21, 1907, V. Bailey (U). New Mexico: Santa Fe, 1847, A. Fendler, No. 548 (H); altitude 11,000 feet, Jemez mountains, September 4, 1906, Vernon Bailey, No. 1,029 (U). Arizona: San Francisco mountain, August 23, 1889, F. H. Knowlton, No. 103 (U).

2. *A. OCCIDENTALIS* Pursh, Fl. Am. Sept., i, 137 (1814). *A. platysepala* Wootton and Standley, Bull. Torrey Cl. xxxiv, 519 (1907). *Amadea occidentalis* (Pursh) Lunell, Am. Midland Nat., iv, 504 (1916). A small annual: leaves borne in a basal rosette, linear to elliptic-lanceolate, often irregularly toothed, glabrous beneath, elsewhere clothed with short, white, stiff, usually simple, pubescence, 3–20 mm. long, 1–5 mm. broad: scapes 1–many, erect or ascending, scabrous with a white stellate short pubescence, 1–7 cm. high: bracts bright green and conspicuous, lanceolate or elliptic, 3–7 mm. long, 1–4 mm. broad: pedicels several, erect or ascending, scabrous with short stellate hairs, 0.5–3 cm. long: calyx-tube campanulate, whitish or straw-coloured, contrasting prominently with the deltoid or broadly lanceolate, bright green, nearly equally long lobes, which are clothed with a short, white, simple pubescence. Dry sandy places, western Ontario south to Texas and from southern Saskatchewan and British Columbia south to Montana, Colorado, Utah, New Mexico, and Arizona. Ontario: Sandy island, lake of the Woods, July 28, 1872, J. Macoun (C. No. 15,856). Wisconsin: Baraboa, 1861, T. J. Hale (P and H). Illinois: Kankakee, 1861, T. J. Hale (P and H); Peoria, 1872, F. Brendel (P and U); common, dry, gravelly soil, Peoria, F. E. McDonald (H). Minnesota: on gneiss rocks in xerophytic plant societies, Montevideo, April 26, 1895, L. R. Moyer, No. 2,808 (U). Iowa: Davenport, Dr. Parry (H);

Decora, May 19, 1893, E. W. D. Holway, No. 586 (U). Missouri: on the rocky summit of a hill in Cedar prairie, 10 miles from the garrison, Cedar creek, April 24, 1810, Nuttall (type U No. 48,677); Independence, April 5, 1894, B. F. Bush, No. 259 (H and U). Arkansas: Nuttall. Louisiana: Nuttall. Manitoba: cultivated ground, Brandon, June 11, 1896, J. Macoun (C. No. 12,727 and H and U). Saskatchewan: Wood mountain, June 6, 1895, J. Macoun (C. No. 11,777). South Dakota: Old Fort Look-out, Sutton Hayes (H); Hot Springs, altitude 3,500 feet, June 13, 1892, P. A. Rydberg, No. 865 (U). Nebraska: in a prairie dog town, Thedford, Middle Loup river, June 15, 1893, P. A. Rydberg, No. 1,299 (U); Hershey, May 8, 1903, C. D. Mell (U No. 607,792). Kansas: prairie, Riley county, April 13, 1895, J. B. Norton, No. 321 (H and U); Butler county, May 12, 1897, Benj. H. Smith (P). Oklahoma: on the False Washita, between Fort Cobb and Fort Arbuckle, 1868, Dr. Edward Palmer, No. 171 (U). Texas: light soils, Dallas, March, 1874, J. Reverchon (Curtis N. Am. Pl. No. 1,794), (P and H and U). Montana: Bozeman, May 13, 1901, E. J. Moore (H and U); uplands, Bozeman, June 16, 1905, J. W. Blankinship, ser. I, No. 339 (H and U); Great Falls, May 8, 1885, R. S. Williams, No. 279 (U). Colorado: Los Pinos (Bayfield), May 17, 1899, C. F. Baker, No. 514 (U); scarce, plains north of Golden City, 1870, E. L. Greene, No. 259 (H). Utah: dry fields, Salt Lake county, May 2, 1908, A. O. Garrett, No. 2,231 (H). New Mexico: 1847, A. Fendler, No. 548 (P); Organ mountains, Dona Ana county, March 3, 1907, E. O. Wooton and P. C. Standley (U No. 564,002); on open hills, Kingston, March 30, 1905, O. B. Metcalfe, No. 1,547 (U). Arizona: moist places of the southwestern plains and mountains, March and April, 1884, C. G. Pringle (part of type coll. of *A. arizonica* Gray, H); Sabina canyon, March 20, 1897, Myrtle Zuck (U No. 664,220); Santa Catalina mountains, 1880, J. G. Lemmon (H). Alberta: damp soil, altitude 2,200–2,500 feet, Rosedale camp, Rosedale, Marion E. Moodie, No. 831 (H). British Columbia: Spences Bridge, May 21, 1875, J. Macoun, No. 1,205 (C and H).

In segregating *A. platysepala* Wooton and Standley from *A. occidentalis* Pursh on the character of the width of the calyx-lobes, the assumption was made that Pursh's species was based on plants having the calyx-lobes of the narrowly deltoid type. It seems possible to make a division on this character into two different categories, but since, when separated into the two series, neither one coincides with any other good characters nor any natural geological or geographical divisions, they do not seem to deserve wide separation in botanical nomenclature. In any case, on examination of Nuttall's collection from Cedar Creek, Missouri, the type of *A. occidentalis* Pursh, which can be seen in the U. S. National Herbarium, will show that these plants are of the phase with broad calyx-lobes. Consequently *A. platysepala* must be treated as a synonym of *A. occidentalis*.

2a. *A. OCCIDENTALIS* Pursh, var. **simplex** (Rydb.) n. comb. *A. simplex* Rydb., Bull. Torrey Cl. XL, 462 (1913). Differing from *A. occidentalis* in having the calyx-lobes narrowly deltoid or subulate. Occasional throughout the range of the species. Illinois: open, gravelly slopes, Peoria, April, 1900, F. E. McDonald (P). Iowa: Charles City, Arthur, (U No. 145,195). Saskatchewan: Twelvemile lake, Wood mountain, June 6, 1895, J. Macoun (C. No. 11,777). North Dakota: Towner, May

29, 1908, J. Lunell (U No. 607,881). South Dakota: Black hills near Fort Meade, May 28, 1887, W. H. Forwood, No. 51 (U). Oklahoma: Huntsville, April 15, 1896, Laura A. Blankinship (H and U). Montana: Missoula, May 5, 1897, M. J. Elrod and assistants, No. 33 (TYPE in Hb., N. Y. Bot. Gard., and fragment in H); Spanish basin, altitude 6,500 feet, June 23, 1897, P. A. Rydberg and E. A. Bessey, No. 4,682 (U). Utah: near Salt Lake City, May, 1882, M. E. Jones (H and U); Big Cottonwood canyon, May 3, 1909, Mrs. Joseph Clemens (H).

Dr. Rydberg in the description of *A. simplex* says it is "related to *A. occidentalis*, but the plant is more delicate, the scapes solitary, bearing a 1-4 flowered umbel with strongly ascending or nearly erect pedicels." The type material and the cited M. E. Jones material from Salt Lake City answer this characterization, but they are obviously very young, starved plants that grew in sterile habitats. This seems to explain the smallness of their leaves, their short, nearly erect pedicels, and their simple, delicate habit. They do have, however, the narrowly deltoid calyx-lobes that recur in many well-developed vigorous plants, with several scapes, from various parts of the broad range of *A. occidentalis*. Consequently, the name *simplex* is retained for the variety with these characters, even though the original conception of *simplex* was in a different sense.

2b. *A. OCCIDENTALIS* Pursh, var. **arizonica** (Gray) n. comb. *A. arizonica* Gray, Proc. Am. Acad., xvii, 221 (1882). A remarkable variety, of delicate texture, but large and sprawling: scapes up to 5 cm. in height: pedicels lax and spreading, up to 5 cm. in length: calyx-lobes ovate-lanceolate, longer than the tube, arching-reflexed. Known only from the mountains surrounding Tucson, Arizona. Arizona: Santa Catalina mountains, April 19, 1881, C. G. Pringle, No. 330 (TYPE H); moist places of the southwestern plains and mountains, March and April, 1884, C. G. Pringle, in part (P and H); Sierra Tucson, April, 1884, W. F. Parish, No. 216 (H).

Pringle's collection, dated 1884, which was widely distributed, with a printed label, contains two things, *A. occidentalis* and the very distinct var. *arizonica*. Gray discovered this confusion, and in the Gray Herbarium separated the material and noted the fact on the sheet. The plant is treated as a variety here because in many characters, especially those of the bracts; the plant is identical with the series called *A. occidentalis*. It is, however, the best-marked extreme.

3. *A. ACUTA* Greene, Man. Bot. San Francisco bay, 238 (1894). *A. asprella* Greene, Pittonia, iv, 150 (1900). Leaves in a basal rosette, linear or linear lanceolate and entire, glabrous beneath, pubescent above, especially near the margins, with stiff, short, simple hairs; scapes 1-many, short, 1-4 cm. high, clothed with sparsely-branched stellate pubescence, which is coarser than in the allied species; bracts ovate lanceolate, with a short attenuate caudate tip, 1-5 mm. long, 0.5-2.5 mm. broad; pedicels stout, stiff and ascendent-divergent, likewise scabrous pubescent; calyx-tube obconic, the stiff subulate lobes spreading at the same angle as the sides of the calyx-tube. Oregon to California. Oregon: Rogue River valley, July 16, 1887, Thomas Howell (photograph in H and N). California: Berkeley hills, altitude 1,000 feet, Alameda county, April 5, 1902,

J. P. Tracy, No. 1,344 (H and R and U); Diablo mountains, April 10, 1878, J. G. Lemmon (H); Alcade, March 28, 1893, T. S. Brandegee (U No. 735,460); Crafton, J. G. Lemmon and C. C. Parry, No. 1,184 (H); San Bernardino, 1876, J. G. Lemmon (H).

A very distinct species, but not very generally recognized as such. Knuth in the *Pflanzenreich* cites it as a synonym of *A. occidentalis*. Under this he cites no west coast material, so it seems doubtful if he had seen any material of *A. acuta*.

A. asprella Greene from Oregon matches perfectly the earlier-described Californian plant.

A. elongata L. of Eurasia is similar in appearance to *A. acuta* and *A. occidentalis*, but differs from both in a number of technical points.

A. capillaris Greene and *A. filiformis* Retz. are not considered in the body of this paper, but the author believes, with Dr. Rydberg, that there is no apparent basis for separating the American material as *A. capillaris* Greene, since it seems indistinguishable from *A. filiformis* Retz.

ANTENNARIA

ANTENNARIA **glabrifolia** Fernald, n. sp., planta laxe humifusa stolonibus flexuosis flagelliformibus ad 1 dm. elongatis; foliis basilaribus elliptico-oblongeolatis subacuminatis mucronatis, 2-5 cm. longis, 0.8-1.4 cm. latis, supra glabris perviridibus, subtus nerviis lateralibus brevibusque prominentibus; caule florifero 2-3 dm. alto albido-tomentoso; foliis caulinis 8-10 supra viridibus glabris vel glabratis linearibus 1.5-3 cm. longis, 1.3-4 mm. latis apice breviter subulato; capitulis femineis 4-6 corymbosis; involucre campanulato, 7-8 mm. alto; bracteis 4-seriatis, exterioribus 4 mm. longis oblongo-lanceolatis olivaceis apice gilvis denticulatis, interioribus lanceolatis subintegris; stylo flavescente ramibus circa 0.5 mm. longis; planta mascula ignota.

Plant loosely humifuse; stolons flexuous, flagelliform, up to 1 dm. long; basal leaves elliptic-oblongeolate, subacuminate, mucronate, 2-5 cm. long, 0.8-1.4 cm. wide, glabrous and bright green above; the short lateral nerves prominent beneath; flowering stem 2-3 dm. high, white-tomentose; cauline leaves 8-10, glabrous or glabrate and green above, linear, 1.5-3 cm. long, 1.3-4 mm. broad, short-subulate at tip; pistillate heads 4-6, corymbose; involucre campanulate, 7-8 mm. high; bracts 4-seriate; the outer 4 mm. long, oblong-lanceolate, olivaceous, the denticulate tip creamy, the inner lanceolate, subentire; style yellowish, its branches about 0.5 mm. long; staminate plant unknown. Quebec: sand dunes, Natashkwan, July 4, 1915, H. St. John, C. No. 90,769 (TYPE in H).

Somewhat resembling the more southern *A. petaloidea* Fernald, but that species has the upper surfaces of the new rosette-leaves canescent-tomentose or arachnoid; the rosette-leaves cuneate-oblongeolate to spatulate-obovate, with the lateral nerves usually obscure; the middle and upper cauline leaves with a long-coloured subulate-aristate tip, and the corymbs larger, with 5 to 15 heads.

A. SPATHULATA Fernald, var. **continentis** Fernald and St. John, n. var., ab specie differt in foliis caulinis 4-5 scarioso-appendiculatis; bracteis 9-10 mm. altis.

Differing from the species in having four or five of the upper cauline leaves scarious-appendaged, and in having the involucre bracts 9–10 mm. in height; the species, on the other hand, has only one or two of the upper leaves scarious-appendaged, and the involucre bracts 6–8.5 mm. in height. Quebec: sand dunes, Natashkwan, July 4, 1915, H. St. John, C. No. 90,768 (TYPE H).

This very local plant of the south shore of Saguenay county seems to be conspecific with *A. spathulata* of Newfoundland, but differing in the characters stated above and occupying an isolated area. The Natashkwan plant is set off as a distinct variety.

ANNOTATED LIST OF SPECIES KNOWN TO GROW ON THE NORTH SHORE OF THE GULF OF ST. LAWRENCE

All names in brackets are of species which have been recorded as from this coast, but which are excluded, because of a misidentification of the specimen or a recent change of name, or because of some other confusion as to the exact significance of the record.

The names in large and small capitals are those of introduced plants.

When a species is known from the region only by one or very few collections, no general statement of habitat or range is given, and all the specimens are cited. When a plant is sufficiently common or well known in occurrence, a statement of its habitat, comparative abundance, and distribution follows directly after the name of the species. In such cases, only a few representative specimens are cited.

To indicate the herbarium in which the individual sheets cited can be found, the same notation is employed as used under the heading "Taxonomic revisions," which immediately follows the explanation of the system.

When a sheet is cited with a number like C. No. 90,362 without the collector's name, it is one of the author's collections.

When the name of a place is given without any further data, the species in question was observed there by the author but not collected.

An abbreviation such as (B³) is a reference to the article containing the notes in question. To obtain the author and title, consult the "Bibliography" and look under B, or whatever letter is sought.

POLYPODIACEÆ (FERN FAMILY)

Woodsia ilvensis (L.) R. Br. Granitic rocks. Brest: rivière à la Truite, cleft in rocks, C. No. 90,018.

W. alpina (Bolton) S. F. Gray. Mingan islands: île du Havre, D. N. Saint-Cyr (Q) (*W. hyperborea* R. Br.).

[*W. hyperborea* R. Br.] of D. N. Saint-Cyr is *W. alpina*.

Cystopteris fragilis (L.) Bernh. Shaded rocks throughout Mingan islands: île Ste. Geneviève, D. N. Saint-Cyr (Q). Petit-Mécatina: wet rock cleft, C. No. 90,017.

[*C. bulbifera* (L.) Bernh.] Mingan seigniory: Mingan river, fall of, D. N. Saint-Cyr. Specimen not found.

Pteretis nodulosa (Michx.) Nieuwland. Mingan seigniory: Sheldrake, D. N. Saint-Cyr. Specimen not found, but record is credible (*Struthiopteris germanica*).

[*Struthiopteris germanica* Willd.] of D. N. Saint-Cyr is the preceding.

Onoclea sensibilis L. Occasional in alluvial habitats. Mingan seigniory: rivière au Tonnerre, D. N. Saint-Cyr (Q). Lagorgendière: Romaine, wet woods, C. No. 90,020.

Thelypteris spinulosa (O. F. Muell.) Nieuwl. Abundant throughout the coast.

T. fragrans (L.) Nieuwl. Letellier: Seven Islands, C. B. Robinson, No. 879 (C and H and N).

T. Phegopteris (L.) Slosson. (*Phegopteris polypodioides* Fée.) Wet or shaded rocks, throughout.

T. Dryopteris (L.) Slosson. (*Phegopteris Dryopteris* (L.) Fée.) Mossy woods, throughout.

T. Robertiana (Hoffm.) Slosson. Mingan islands: abundant, Eskimo island (île au Marteau), base of limestone cliff, C. No. 90,008.

[*Aspidium spinulosum* Sw.] *Thelypteris spinulosa*.

Athyrium angustum (Willd.) Presl., var. *rubellum* (Gilbert) Butters. Charnay: Etamamiou river, alder swamp, C. No. 90,013.

[*Phegopteris Dryopteris* (L.) Fée.] *Thelypteris Phegopteris*.

[*P. polypodioides* Fée.] *Thelypteris Phegopteris*.

Asplenium viride L. Mingan seigniory: Betchouane, cleft in limestone rocks, C. No. 90,012.

[*A. Filix fœmina* (L.) Bernh.] *Athyrium angustum*, var. *rubellum*.

Cryptogramma Stelleri (Gmel.) Prantl. Mingan islands and Pointe-aux-Esquimaux: wet limestone cliffs. Eskimo island: wet limestone cliffs, C. No. 90,011. Also at the strait of Belle Isle, on the Labrador side of Blanc-Sablon river.

[*Pellaea gracilis* Hook.] See preceding.

Pteridium latiusculum (Desv.) Maxon. Warm dry hillsides, infrequent. Rivière au Tonnerre: D. N. Saint-Cyr. Boishébert: baie des Moutons, grassy hillside, C. No. 90,010.

[*Pteris aquilina* L.] *Pteridium latiusculum*.

Polypodium vulgare L. Letellier: Seven Islands, C.B. Robinson, No. 752 (C. and N). Mingan seigniory: Mingan river, falls of, D. N. Saint-Cyr. This specimen was not found in the herbarium (Q), but the record is credible.

[*P. Dryopteris* L.] *Thelypteris Dryopteris*.

[*P. Phegopteris* L.] *Thelypteris Phegopteris*.

OSMUNDACEÆ (FLOWERING FERN FAMILY)

Osmunda Claytoniana L. Wet woods, especially near a river bank, not frequent. Rivière au Tonnerre: D. N. Saint-Cyr, no specimen found. Brouague: Shekatika river, edge of thicket on island in, C. No. 90,021.

O. cinnamomea L. Occasional at the edge of wet thickets or on hillsides. Rivière au Tonnerre: D. N. Saint-Cyr (Q). Ile Ouapitagone: tundra, C. No. 90,022.

OPHIOGLOSSACEÆ (ADDER'S TONGUE FAMILY)

Botrychium Lunaria L. Occasional in grassy border above the beach. Mingan seigniory: Betchouane, meadow, C. No. 90,025. Charnay: pointe au Maurier, grassy top of sand beach, C. No. 90,024. Archipel du Vieux-Fort: recorded from Bonne-Espérance, W. A. Stearns (S¹). Brest: Brador, gravelly thicket back of strand, M. L. Fernald and K. M. Wiegand; C. No. 2,349 (H).

B. ramosum (L.) Asch. Letellier: pointe au Basque, in sand near; Seven Islands, C. B. Robinson, Nos. 830 and 836 in part (*B. neglectum* Wood) (C). Natashkwan: sand dunes, C. No. 90,026.

B. lanceolatum (Gmel.) Ångström. Letellier: pointe au Basque, growing in sand near; Seven Islands, C. B. Robinson, No. 836 in part (C and N). See *Rhodora*, xx, 19 (1918). Mingan seigniory: Mingan river, mouth of, Wm. Palmer (U).

B. ternatum (Thunb.) Sw., var. *rutæfolium* (A. Br.) D. C. Eaton. Letellier: pointe au Basque, in sand near; Seven Islands, C. B. Robinson, No. 829 (C and N). St. Vincent: Netagamou river, sand dunes at mouth of, C. No. 90,027.

B. virginianum (L.) Sw., var. Apparently an undescribed variety, but known only by this one over-mature collection. See *Rhodora*, xix, footnote 210 (1917). Mingan seigniory: Betchouane, grassy shore, C. No. 90,028.

EQUISETACEÆ (HORSETAIL FAMILY)

Equisetum arvense L. Wet thickets, especially in river valleys, general. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Brest: Jones point, swale on hillside, C. No. 90,029.

E. arvense, var. *decumbens* Meyer. Mingan seigniory: Pointe-aux-Esquimaux, sandy bank, C. No. 90,031.

E. sylvaticum L., var. *pauciramosum* Milde. Southern Labrador: Storer (H).

E. sylvaticum, var. *pauciramosum*, f. *multiramosum* Fernald. Wet woods and thickets, general. Mingan seigniory: C. W. Townsend (H). Lagorgendière: Romaine, wooded bottomland, C. No. 90,032.

E. palustre L. Wet banks of larger rivers. Natashkwan river: common from mouth to 80 miles up, C. W. Townsend (H). St. Augustin river: sedgy river bank, C. No. 90,033.

E. palustre, var. *nigridens* St. John. Lagorgendière: Romaine, muddy edge of pool in tundra, C. No. 90,034.

E. limosum L. Occasional in ponds or by edge of streams, throughout. Mingan seigniory: Mingan river, D. N. Saint-Cyr. St. Augustin river: sedgy river bank, C. No. 90,035. Brest: Blanc-Sablon, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,363 (H).

[*E. fluviatile* L.] *E. limosum*.

[*E. hyemale* L.] Recorded from Mingan islands, D. N. Saint-Cyr. No specimen found.

E. scirpoides Michx. Deep woods. Known only from Mingan islands: île Ste. Geneviève, mossy woods, C. No. 90,038; recorded by D. N. Saint-Cyr. Also on the Newfoundland-Labrador side of the strait of Belle Isle.

LYCOPODIACEÆ (CLUB MOSS FAMILY)

Lycopodium Selago L. Mossy banks, infrequent, from Charnay eastward to the strait of Belle Isle. Charnay: île Watagheistic, mossy bank, C. No. 90,040. Brest.

L. Selago, var. *appressum* Desv. Exposed mossy crests and hilltops, general. Mingan seigniory: Piashti bay, tundra, C. No. 90,042. Boishébert: mossy hillside, C. No. 90,041.

L. Selago, var. *patens* (Beauv.) Desv. Boishébert: baie des Moutons, wooded brookside, C. No. 90,039.

[*L. lucidulum* Michx.] Erroneously recorded by J. Macoun (M) as collected by S. R. Butler on Caribou island. Neither Butler (B⁵) nor W. A. Stearns (S¹) lists the species.

L. annotinum L. Thickets and borders of woods, general. Mingan seigniory: Mingan river, D. N. Saint-Cyr (Q). Charnay: pointe au Maurier, thicket, C. No. 90,043.

L. annotinum, var. *pungens* (La Pylaie) Desv. Dry or mossy thickets, general. Mingan seigniory: Pointe-aux-Esquimaux, sandy thicket, C. No. 90,044.

L. clavatum L. Sandy banks, especially near river mouths, occasional. Mingan seigniory: Mingan river, D. N. Saint-Cyr (mixed with *L. annotinum*) (Q). St. Vincent: Netagamiou river, sandy bank, C. No. 90,048. Brest.

L. clavatum, var. *monostachyon* Grev. and Hook. Dry hillsides. Known from Boishébert: baie des Moutons, rocky hillside, C. No. 90,049. Observed at Mingan.

L. clavatum, var. *megastachyon* Fernald and Bissell. Dry woods, from two localities. Seven Islands: C. B. Robinson, No. 839 (H). Natashkwan: evergreen woods on sand dunes, C. No. 90,050.

L. obscurum L. Mossy woods, eastward as far as Shekatika. Seven Islands: C. B. Robinson, No. 886 (H). Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Brouague: Petite rivière Coxipi, mossy evergreen woods, C. No. 90,051.

L. obscurum, var. *dendroideum* (Michx.) D. C. Eaton. Eskimo river (St. Paul river): J. A. Allen (called *L. dendroideum* Michx.) (Hb. Conn. Agric. Exp. Sta., New Haven). Recorded by D. N. Saint-Cyr from Eskimo island.

L. sitchense Rupr. Dry sandy hills, throughout. Mingan seigniory: Pointe-aux-Esquimaux, sandy thicket, C. No. 90,053. Brouague: Petite rivière Coxipi, dry mossy hills, C. No. 90,052.

L. complanatum L. Sand dunes or dry thickets, throughout. Seven Islands: D. N. Saint-Cyr (*L. sabinæfolium* Willd.). Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). St. Vincent: Netagamiou river, sand dunes at mouth of, C. No. 90,055. Brest: on the gneiss plain, among bushes, M. L. Fernald and K. M. Wiegand, No. 2,392 (H).

L. complanatum, var. *flabelliforme* Fernald. Mingan seigniory: Mingan harbour, D. N. Saint-Cyr (*L. complanatum*) (Q).

[*L. sabinæfolium* Willd.] *L. complanatum*.

SELAGINELLACEÆ

Selaginella selaginoides (L.) Link. Mingan islands and strait of Belle Isle, grassy banks. Mingan seigniory: Pointe-aux-Esquimaux, wet rocks, C. No. 90,057. Brest: anse des Dunes, grassy hollow, C. No. 90,056.

S. rupestris (L.) Spreng. Seven Islands: C. B. Robinson, No. 915 (H).

ISOËTACEÆ (QUILLWORT FAMILY)

Isoëtes echinospora Dur., var. *Braunii* (Dur.) Engelm. Shallow ponds, general. Boishébert: baie des Moutons, under one foot of water, hillside pond, C. No. 90,058. Lagorgendière: Olomanoshibou river, tidal pool at mouth of, C. No. 90,061.

TAXACEÆ (YEW FAMILY)

Taxus canadensis Willd. Deep woods, as far east as Natashkwan. Mingan islands: île au Bouleau, D. N. Saint-Cyr; île Ste. Geneviève, wooded pond shore, C. No. 90,062. Observed at Seven Islands bay and Natashkwan.

[*T. baccata* L., var. *canadensis* Gray.] *T. canadensis*.

PINACEÆ (PINE FAMILY)

[*Pinus Strobus* L.] "East as far as Mingan," and so represented on his map. R. Bell (B³).

Pinus Banksiana Lam. Seven Islands: D. N. Saint-Cyr (Q), C. B. Robinson (C). Mr. Maloney of Mingan told the writer of a single tree growing 9 miles inland from Mingan. The record seems trustworthy.

Larix laricina (Du Roi) Koch. Bogs and wet woods, common but only as shrubs or small trees.

[*L. americana* Michx.] *L. laricina*.

Picea canadensis (Mill.) BSP. Forming woods, especially on the sandy bottomlands, and edge of sand dunes, general.

[*P. rubra* (Du Roi) Dietr.] C. W. Townsend records the red spruce at Pointe-aux-Esquimaux (T¹ 15 and 217). At many places on the coast are spruces with yellowish-green needles of shape and size quite similar to those of the tree called *P. rubra*. In all of these examined the cones were definitely those of *P. mariana*. It would be surprising to find the more southern *P. rubra* in this locality.

P. mariana (Mill.) BSP. Bogs and mossy hillsides, the commonest tree, forming dense, low forests, everywhere.

[*Abies nigra* Poir.] *Picea mariana*.

[*Abies alba* Michx.] *Picea canadensis*.

Abies balsamea (L.) Mill. Forming the forest in the drier habitats, especially back from the coast, everywhere.

[*Juniperus communis* L.] *J. communis*, var. *montana*.

Juniperus communis L., var. *montana* Ait. Dry and exposed habitats throughout.

J. horizontalis Moench. Exposed and usually dry habitats, common as far east as Mingan islands, local from there to the strait of Belle Isle. Mingan seigniory: Pointe-aux-Esquimaux, C.W. Townsend (H). Archipel du Vieux-Fort: île Herbée, rocky crest, C. No. 90,064.

[*J. Sabina* L., var. *procumbens* Pursh.] *J. horizontalis*.

SPARGANIACEÆ (BUR-REED FAMILY)

Sparganium diversifolium Graebn. Mingan seigniory: Watshishu, D. N. Saint-Cyr (*S. simplex* Huds., var. *genuinum* Gr.) (Q).

[*S. simplex* Huds., var. *genuinum* Gr.] *S. diversifolium*.

S. angustifolium Michx. Shallow ponds and streams, general. Recorded by Abbé J. B. A. Ferland from Boishébert, Tabatière, 1859. Archipel du Gros-Mécatina: Tête à la Baleine, C. No. 90,075.

[*S. simplex* Huds., var. *angustifolium* Gray.] *S. angustifolium*.

S. hyperboreum Laest. Shallow ponds, occasional throughout. Natashkwan: grassy pond, C. No. 90,080.

POTAMOGETONACEÆ (PONDWEED FAMILY)

Potamogeton natans L. Mingan islands: île à la Chasse, in 5 feet of water, small pond, C. No. 90,081.

P. epihydrus Raf. Deep slow-flowing brooks, occasional. Mingan; Coacoachou; pointe au Maurier; and Brouague: Petite rivière Coxipi, shallow brook, C. No. 90,082.

P. epihydrus, var. *cayugensis* (Wieg.) A. Benn. Brest: Brador, deep brook, M. L. Fernald and K. M. Wiegand, No. 2,440 (H).

P. alpinus Balbis. Shallow ponds, known from Natashkwan: pond in sand dunes, C. No. 90,083 and 90,084. Archipel Ouapitagone: île Ouapitagone, pool in tundra, C. No. 90,085.

P. heterophyllus Schreb. Natashkwan: slough in sand dunes, C. No. 90,086.

P. perfoliatus L., var. *gracilis* Fries. Brackish water, occasional. Natashkwan; Netagamiau river; and Brest: Blanc-Sablon river, shallow, sandy-bottomed pools, M. L. Fernald and K. M. Wiegand, No. 2,450 (H); and Blanc-Sablon river, C. No. 90,087. These are like the European species and different from the American *P. bupleuroides* Fernald in having heavy peduncles and the veins of the leaves prominent.

P. pusillus L. Slow-flowing water, known only from Brest: Blanc-Sablon river, shallow, sandy-bottomed pools, M. L. Fernald and K. M. Wiegand, No. 2,455 (H).

P. pusillus, var. *Sturrockii* A. Benn. Charnay: pointe au Maurier, deep, slow brook in tundra, C. No. 90,090.

P. pusillus, var. *tenuissimus* M. and K. Shallow, quiet waters, known from Mingan seigniory: lagoon from Mingan river, C. No. 90,088. Brest: shallow pond, Longue pointe, C. No. 90,089.

P. pectinatus L. Charnay: rivière Etamamicu, pool in brackish marsh, C. No. 90,091.

P. filiformis Pers., var. *borealis* (Raf.) St. John. Shallow ponds, common at Mingan islands and strait of Belle Isle, but seen at only one station between, Etamamiou. Mingan islands: île à la Chasse, in 5 feet of water, small pond, C. No. 90,092. Brest: Longue pointe, shallow pond, C. No. 90,093.

P. moniliformis St. John. Brest: rivière Blanc-Sablou, shallow, sandy-bottomed pools, M. L. Fernald and K. M. Wiegand, No. 2,463 (H); rivière Blanc-Sablou, above tide-mark, C. No. 90,094.

Zannichellia palustris L. Brackish pools, at mouths of rivers, eastward as far as Natashkwan. Mingan. Natashkwan: Little Natashkwan river, brackish pool in marsh by, C. No. 90,095.

Ruppia maritima L., var. *rostrata* Agardh. Natashkwan: pool in salt marsh, C. No. 90,097. Charnay: rivière Etamamiou, tidal pool, C. No. 90,096.

R. maritima, var. *subcapitata* Fernald and Wiegand. Brackish pools, eastward as far as Shekatika. Seven Islands: C. B. Robinson, No. 916 (H). Charnay: pointe au Maurier, shallow tidal pool, C. No. 90,099. Brouague: Robin bay, brackish pool, C. No. 90,100.

Zostera marina L. Sheltered bays. Sterile material observed at numerous points.

Z. marina, var. *angustifolia* Hornem. Shallow bays and inlets. Seven Islands: C. B. Robinson, No. 733 (H). Mingan seigniory: Pointe-aux-Esquimaux, filling shallow bay, C. No. 90,101. Charnay: pointe au Maurier, shallow bay, C. Nos. 90,102 and 90,103.

JUNCAGINACEÆ (ARROW GRASS FAMILY)

Triglochin palustris L. Brackish marshes, occasional. Etamamiou, and Brouague: Shekatika river, tidal mud at mouth of, C. No. 90,104. W. A. Stearns reports it, "in the interior rare, in marshes" (S¹).

T. maritima L. Brackish shores, throughout.

Scheuchzeria palustris L. Natashkwan: sphagnum bog, C. No. 90,107.

ALISMACEÆ (WATER-PLANTAIN FAMILY)

Sagittaria heterophylla Pursh. Mingan seigniory: Mingan river, shallow lagoon from, C. No. 90,108.

GRAMINEÆ (GRASS FAMILY)

[*Panicum capillare* L.] D. N. Saint-Cyr records this from baie des Homards. In the collection (Q) there is a spray from a panicle of *Panicum capillare* mixed with *Agrostis hyemalis* var. *geminata* (called *A. scabra*) which is recorded as coming from Sheldrake river, is labelled on the cover as from rivière au Tonnerre, and under the plant is a loose slip indicating that it comes from baie des Homards. This baie des Homards is southwest of Seven Islands, just outside of our limits. In any case the data is too confused to win credence.

ANTHOXANTHUM ODORATUM L. D. N. Saint-Cyr records this from Mingan islands, île Ste. Geneviève. This island is unsettled except for a fisherman's temporary camp, and not a place where one would expect to find introduced plants. Specimen not found. There is no reason, however, to discredit this record.

Phalaris arundinacea L. This is recorded from Mingan seigniory: pointe Sauvage, baie du Pillage, July 25, 1860, J. Richardson (R¹). It is known from Gaspé and Newfoundland and is not unlikely here.

Hierochloë alpina (Sw.) R. and S. Exposed hill crests, Petit-Mécatina and eastward to the strait of Belle Isle. Petit-Mécatina: rocky crests, C. No. 90,109. Baie des Moutons and Brest: Jones point, turfey hill crests, C. No. 90,110.

H. odorata (L.) Wahlenb., var. *fragrans* (Willd.) Richter. Rocky or marshy seashores, general.

Milium effusum L. Recorded from rivière au Tonnerre: D. N. Saint-Cyr. No specimen found. Brest: Blanc-Sablon, wet limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,489 (H).

Muhlenbergia racemosa (Michx.) BSP. Mingan islands: île Ste. Geneviève, boggy thicket, C. No. 90,113.

PHLEUM PRATENSE L. Sparingly introduced. Bougainville: St. Augustin, near the Hudson's Bay post, C. No. 90,114.

P. alpinum L. Strait of Belle Isle: grassy slopes, region of sedimentary rocks. Archipel du Blanc-Sablon: Greenly island, J. A. Allen (in Hb. Conn. Exp. Sta., New Haven). Brest: Blanc-Sablon, wet banks, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,497 (H); pointe à Peau, grassy slope, C. No. 90,115; Brador, wet slopes, M. L. Fernald and K. M. Wiegand, No. 2,498 (H).

Alopecurus aristulatus Michx. Wet river or pond shores. Known from St. Augustin river: sand bar, C. No. 90,116.

A. aristulatus, var. *Merriami* (Beal) St. John. Brest: anse des Dunes, sprawling on sandy pond shore, C. No. 90,117.

Agrostis alba L., var. *maritima* (Lam.) G. F. W. Meyer. Exposed sands near the sea, known as far east as Natashkwan. Mingan seigniory: Pointe-aux-Esquimaux, roadside, C. No. 90,119. Natashkwan: sprawling on sand flat, C. No. 90,118.

A. hyemalis (Walt.) BSP., var. *geminata* (Trin.) Hitchc. Wet meadows, general. Collection of D. N. Saint-Cyr, recorded as from Sheldrake river, the cover containing the sheet is labelled rivière au Tonnerre, and a loose ticket under sheet indicates baie des Homards. The plant is this species (called *A. scabra*) but it is difficult to tell where it came from.

Another collection by D. N. Saint-Cyr (called *A. canina* L.) was recorded as from baie des Homards, but a loose ticket under the plant says "Battures de Sable, Mingan river." Ile Kécarpoui: sphagnum bog, C. No. 90,121. Chevalier: St. Paul, edge of marsh, C. No. 90,120.

[*A. canina* L.] See *A. hyemalis*, var. *geminata*. Recorded by W. A. Stearns from Labrador, 1875, but the plant is *A. borealis*.

[*A. scabra* Willd.] Record of D. N. Saint-Cyr. Plant is *A. hyemalis*, var. *geminata*.

A. borealis Hartm. (*A. paludosa* Scribn.) Exposed rocky and turfy crests, from Ouapitagone eastward to the strait of Belle Isle. Ile Ouapitagone: rocky crest, C. No. 90,123. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 22 (H). Brest: Jones point, sandy pond shore, C. No. 90,122; Blanc-Sablon, A. C. Waghorne (U No. 217,943). W. A. Stearns from Labrador (called *A. canina* L.) (U).

[*A. paludosa* Scribn.] U.S. Div. Agrost., Bull., xi, 49 and F. 7 (1898). This was described from a collection by A. C. Waghorne, September 25, 1893, Blanc-Sablon. It is described as awnless, and Hitchcock, Bur. Pl. Indust., Bull. lxviii, 53 (1905), citing it in synonymy calls it "an awnless form of *A. borealis*." The plant may yet prove for some reason to be distinct. The collection from Ouapitagone, C. No. 90,123, is a very close match with the Waghorne plant.

Calamagrostis canadensis (Michx.) Beauv. Grassy shores, apparently throughout. Reported from Mingan seigniory: pointe Sauvage, baie du Pillage, J. Richardson (R¹). Natashkwan river: C. W. Townsend, in part (H).

C. canadensis, var. *acuminata* Vasey. Recorded from Eskimo river: J. A. Allen, No. 19. See U. S. Div. Agrost., Bull. xi, 30 (1898).

C. Langsdorfii (Link) Trin. Grassy shores and borders of woods, very common throughout. Lagorgendière: Romaine, grassy brookside, C. No. 90,127. Brest: Blanc-Sablon, on the gneiss plain, in sand, M. L. Fernald and K. M. Wiegand, No. 2,539 (H).

C. neglecta (Ehrh.) G. M. and S. Wet shores and borders of woods, general. Brouague: Shekatika river, turfy border at mouth, C. No. 90,124.

[*C. labradorica* Kearney] Bull. U.S. Div. Agrost., xi, 38-9 (1898). The key character separating this from *C. hyperborea* and *C. crassiglumis* is: "Not exceeding 5 dm. in height, panicle slender, much interrupted toward base, awn not nearly equalling glume." On examining the type specimen: Bonne-Espérance, July 29, 1882, J. A. Allen, No. 18 (U), it was seen that the two mature panicles were definitely interrupted. Of the spikelets examined two had no awns at all; one had a very short awn, one-sixth the length of the lemma, attached one-third of the distance from the summit of the lemma; one had an awn attached near the base of, and nearly equalling, the lemma. This plant seems better treated as *lapponica*.

C. lapponica Kunth. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 18. Brest: Blanc-Sablon, gravelly thicket back of strand, and abundant in sand or bogs, on the gneiss plain, M. L. Fernald and K. M. Wiegand, Nos. 2,551 and 2,547 (H).

C. hyperborea Lange. Rocky and grassy shores, throughout. Archipel Ouapitagone: Romaine (Vieille Romaine), rocky shore, C. No. 90,125.

Ammophila breviligulata Fernald. Coastal sand dunes, very infrequent. Mingan and Natashkwan: outer sand dunes, C. No. 90,128. Brest: Brador, sand dunes, M. L. Fernald and K. M. Wiegand, No. 2,562 (H).

Cinna latifolia (Trev.) Griseb. Meadows and borders of woods, in the more sheltered parts, general. Boishébert: Tabatière, meadow, C. No. 90,129. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,564 (H).

Trisetum spicatum (L.) Richter, var. *Maidenii* (Gandoger) Fernald. Dry banks, occasional throughout. Seven Islands: île Manowin, D. N. Saint-Cyr (called *T. subspicatum* Beauv., var. *molle* Gray) (Q). Mingan seigniory: Pointe-aux-Esquimaux, rocky limestone headland, C. No. 90,132. Lagorgendière: Romaine, rocky river bank, C. No. 90,130.

T. spicatum, var. *pilosiglume* Fernald. Turfy slopes in region of calcareous sandstone rocks, strait of Belle Isle. Brest: Brador, damp calcareous rocks, M. L. Fernald and K. M. Wiegand, No. 2,570 (H); pointe à Peau, dry turf, C. No. 90,133.

Deschampsia flexuosa (L.) Trin. Grassy banks and borders of woods, throughout. Goynish: îles Boisées de Cap Blanc, Washtawouka, rocky shore, C. No. 90,138. Brouague: Robin bay, border of woods, C. No. 90,135.

D. flexuosa, var. *montana* (L.) Ledeb. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen (in Hb. Conn. Exp. Sta., New Haven).

D. caespitosa (L.) Beauv. Brest: Blanc-Sablon, brackish shore, M. L. Fernald and K. M. Wiegand, No. 2,583 (H). D. N. Saint-Cyr records this from Sheldrake river, August, 1882 (called *Aira caespitosa* L.), no specimen found.

D. atropurpurea (Wahl.) Scheele. Lagorgendière: Romaine, rocky river bank, C. No. 90,139.

[*Aira flexuosa* L.] *Deschampsia flexuosa*.

[*Aira caespitosa* L.] *Deschampsia caespitosa*.

Danthonia spicata (L.) Beauv. Mingan seigniory: Mingan, grassy edge of woods, C. No. 90,140.

[*Spartina Michauxiana* Hitchc.] This is recorded from Rivière Pentecôte basin: August 28, 1884. The cover containing the plant is marked rivière Pentecôte, but a ticket under the plant says "lac St. Jean, A. 13/88." *S. Michauxiana* grows from northern Maine to Tadoussac at the mouth of the Saguenay, and westward. It seems probable that the plant in question came from lake St. John, as the ticket would indicate.

[*S. cynosuroides* Willd.] *S. Michauxiana*.

Spartina alterniflora Loisel. Natashkwan: havre des Canadiens, salt marsh, C. No. 90,141.

Catabrosa aquatica (L.) Beauv. Spring-fed marshes by the shore, from îles Netagamious eastward to the strait of Belle Isle. Archipel du Petit-Mécatina: Harrington, springy marsh near the shore, C. No. 90,142. Brest: Blanc-Sablon on the gneiss plain in wet places, M. L. Fernald and K. M. Wiegand, No. 2,600 (H).

Melica striata (Michx.) Hitchc., f. *albicans* Fernald. Mingan islands: île Ste. Geneviève, boggy woods, C. No. 90,143.

POA ANNUA L. Introduced, not spreading from the settlements, general. Boishébert: Tabatière, wet dooryard, C. No. 90,798.

P. eminens J. S. Presl. Gravel beaches, turfey shores, and rocky ledges near the sea, general. Mingan islands: île Ste. Geneviève, D. N. Saint-Cyr, No. 69 (called *P. glumaris* Trin.) (Q). Archipel Washicoutai: île Triple, wet turf, C. No. 90,800. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen (H).

[*P. glumaris* Trin.]. *P. eminens*.

P. alpina L. Mingan islands and strait of Belle Isle: calcareous ledges. Mingan islands: île du Havre, D. N. Saint-Cyr (Q). Mingan seigniory: Pointe-aux-Esquimaux (H), and C. No. 90,801. Reported by W. A. Stearns from St. Paul. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,659 (H).

P. alpina, var. *Bivonæ* (Parl.) St. John. Mingan islands: Eskimo island, limestone sea-cliffs, C. No. 90,802; intermediate material found at Eskimo island, C. No. 90,803.

P. glauca Vahl. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,651 (H). Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 9 (Hb. Conn. Agric. Exp. Sta., New Haven).

P. nemoralis L. Grassy banks, known from Chevalier to the straits, probably more widely dispersed. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 30 (H). Chevalier: St. Paul, dooryard, C. No. 90,804. Brest: rivière à la Truite, grassy hillside, C. No. 90,805.

P. palustris L. (*P. triflora* Gilib.). Grassy shores, apparently throughout. Charnay: rivière Etamamiou, grassy shore, C. No. 90,807. Chevalier: St. Paul, grassy shore, C. No. 90,806.

P. pratensis L. Grassy shores, banks, edge of woods, common throughout. Natashkwan: sand dunes, C. No. 90,809. Pontchartrain: Vieux-Fort, grassy shore, C. No. 90,813.

[*Glyceria melicaria* (Michx.) Hubbard.] Mingan islands: île du Fantôme, D. N. Saint-Cyr. (The plant is called *G. elongata* and published as from rivière Pentecôte. If it came from there it should be excluded from this list.)

[*G. elongata* Trin.] *G. melicaria*.

G. canadensis (Michx.) Trin. Grassy brooksides, eastward as far as Brouague. Known from rivière au Tonnerre: D. N. Saint-Cyr (Q). Brouague: Petite rivière Coxipi, swampy brookside, C. No. 90,144.

G. nervata Trin. Wet thickets, eastward as far as Brouague. Recorded from rivière au Tonnerre: D. N. Saint-Cyr, August, 1882. Specimen not found. Mingan islands: île Ste. Geneviève, boggy thicket, C. No. 90,146. Brouague: Petite rivière Coxipi, alder thicket by, C. No. 90,145.

G. nervata, var. *stricta* Scribn. Region of Mingan islands and strait of Belle Isle, wet meadows or pond shores. Mingan islands: île du Havre, pond shore, C. No. 90,148. Mingan seigniory: Betchouane, swale, C. No. 90,147. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,609 (H).

Glyceria Fernaldii (Hitchc.) St. John. Lagorgendière: Romaine, sprawling on muddy brookside, C. No. 90,139. Charnay: rivière Etamamiou, marshy brookside, C. No. 90,150.

[*G. maritima* Wahl.] of D. N. Saint-Cyr is *Puccinellia paupercula* var. *alaskana*.

Puccinellia paupercula (Holm) Fernald and Weatherby. Archipel Ouapitagone: Romaine, strand, C. No. 90,154. Charnay: pointe au Maurier, rocky shore, C. Nos. 90,152 and 90,153. Archipel de Kécarpoui: île du Petit Rigolet, salt marsh, C. No. 90,151.

P. paupercula, var. *alaskana* (Scribn. and Merr.) Fernald and Weatherby. Mingan islands: île du Havre, rocky limestone shore, C. No. 90,155; île Ste. Geneviève, D. N. Saint-Cyr (called *Glyceria maritima* Wahl.) (Q).

P. coarctata Fernald and Weatherby. Lagorgendière: Romaine, rocky bank, C. No. 90,156. Recorded from baie au Saumon, J. A. Allen. See *Rhodora*, xviii, 18 (1916). Brest: Jones point, rocky shore, C. No. 90,157.

[*Festuca octoflora* Walt.] Recorded from Sheldrake river, D. N. Saint-Cyr, August 22, 1884 (called *F. tenella* Willd.). Specimen not found, is probably *F. rubra*.

[*F. tenella* Willd.] *F. octoflora*.

F. rubra L. Grassy shores, throughout. Archipel Ouapitagone: Romaine, top of strand, C. No. 90,160. Brest: rivière Blanc-Sablon, sand dunes by, C. No. 90,158.

F. rubra, var. *megastachys* Gaud. Mingan, and strait of Belle Isle, region of calcareous rocks. Mingan seigniory: Mingan, thicket on sand dunes, C. No. 90,163. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,673 (H).

F. ovina L. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen. No. 12 (Hb. Conn. Agric. Exp. Sta., New Haven). Archipel du Blanc-Sablon: île Perroquets, J. A. Allen (Hb. Conn. Agric. Exp. Sta., New Haven). Recorded from St. Paul by W. A. Stearns (S¹).

F. ovina, var. *supina* (Schur) Hack. Archipel de Kécarpoui: île Kécarpoui, bare hilltop, C. No. 90,164.

F. ovina, var. *vivipara* L. Brest: Longue pointe, mossy turf, C. No. 90,165.

Bromus ciliatus L. Borders of woods, occasional throughout. Mingan islands: île du Havre, wet thicket, C. No. 90,166. St. Augustin river: sandy river bank, C. No. 90,167. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,625 (H).

AGROPYRON REPENS (L.) Beauv. Introduced at Lagorgendière: Romaine, thicket near settlement, C. No. 90,172.

A. caninum (L.) Beauv., var. *Hornemanni* (Koch) Pease and Moore. Grassy banks and shores, occasional throughout. Mingan islands: île Ste. Geneviève, boggy thicket, C. No. 90,171. Charnay: pointe au Maurier, grassy shore, C. No. 90,170. St. Augustin river: sandy isle in river, C. No. 90,168. Brest: rivière à la Truite, grassy hillside, C. No. 90,169; Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,689 (H).

Hordeum boreale Scribn. and Smith. Brest: rivière Blanc-Sablon, brackish shore, M. L. Fernald and K. M. Wiegand, No. 2,695(H).

H. JUBATUM L. Sparingly introduced along western part of coast. Pointe-aux-Esquimaux; Betchouane; and Natashkwan: grassy shore, C. No. 90,173.

Elymus arenarius L., var. *villosus* E. Mey. Very common all along the coast and extending inland along the river sands for short distances, in St. Augustin river, 6 miles above tide-water.

[*E. mollis* Trin.] *E. arenarius*, var. *villosus*.

CYPERACEÆ (SEDGE FAMILY)

Eleocharis palustris (L.) R. Br. Shallow ponds and wet shores, throughout. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Charnay: rivière Etamamiou, marshy brookside, C. No. 90,177. Brest: Blanc-Sablon, shallow pond margin, 2 feet of water, C. No. 90,176.

E. palustris, var. *glaucescens* (Willd.) Gray. Etamamiou to strait of Belle Isle, brackish shores. Charnay: Etamamiou river, sand shore of the estuary of, C. No. 90,181. Brouague: Shekatika river, tidal mud at mouth of, C. No. 90,180. Chevalier: St. Paul, brackish shore, C. No. 90,179.

E. acicularis (L.) R. and S. Reported from rivière au Tonnerre: D. N. Saint-Cyr, but specimen not seen. Natashkwan: pond shore, in dune hollow, C. No. 90,182.

E. tenuis (Willd.) Schultes. Lagorgendière: Romaine, pond in tundra, C. No. 90,183.

Scirpus cæspitosus L. Turfy or rocky crests, common throughout. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: Verrill, Hyatt, and Shaler (Y). Lagorgendière: Romaine, tundra, C. No. 90,185.

S. hudsonianus (Michx.) Fernald. Mingan islands and Labrador side of strait of Belle Isle, open bogs. Mingan islands: Verrill, Hyatt, and Shaler (Y); D. N. Saint-Cyr (called *Eriophorum alpinum* L.) (Q); île Ste. Geneviève, larch swamp, C. No. 90,186.

S. rufus (Huds.) Schrader. Reported from Mingan islands: île à la Chasse, D. N. Saint-Cyr. Specimen not seen (*Blysmus rufa* Panz.)

S. americanus Pers. Mingan seigniory: Watshishu, D. N. Saint-Cyr (called *S. pungens* Vahl.) (Q).

[*S. pungens* Vahl.] *S. americanus*.

S. rubroinctus Fernald. Grassy brooksides and meadows, occasional throughout. Natashkwan river: C. W. Townsend (H). Lagorgendière: Romaine, grassy brookside, C. No. 90,187. Brest: Jones point, grassy brookside, C. No. 90,188; Blanc-Sablon, and by streams, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,725 (H).

[*S. atrovirens* Muhl.] Recorded from Mingan, July 20, 1882, D. N. Saint-Cyr. Specimen not seen, but is undoubtedly *S. atrocinctus* which grows at Mingan.

S. atrocinctus Fernald. Wet hollows or shores, occasional eastward as far as Gros-Mécatina. Mingan seigniory: Mingan, sand bank, C. No. 90,189. Natashkwan: wet dune hollow, C. No. 90,190. Gros-Mécatina: bog hole, C. No. 90,191.

S. atrocinctus, var. *brachypodus* Fernald. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen (in Hb. Conn. Exp. Sta., New Haven).

[*Blysmus rufa* Panz.] *Scirpus rufus*.

[*Eriophorum alpinum* L.] *Scirpus hudsonianus*.

Eriophorum Chamissonis C. A. Meyer. Wet meadows and pond shores, throughout. Mingan islands: île à la Chasse, D. N. Saint-Cyr (called *E. polystachyon* L.) (Q). Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Ile Ouapitagone: bog, C. No. 90,194. Brest: on the gneiss plain in bogs, M. L. Fernald and K. M. Wiegand, No. 2,731 (H).

[*E. russeolum* Fries.] *E. Chamissonis*.

[*E. polystachyon* L.] *E. Chamissonis*.

E. callitrix Cham. Ledges and drier parts of the tundra, very abundant throughout. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: Grand île, D. N. Saint-Cyr (called *E. vaginatum* L.) (Q). Natashkwan river: C. W. Townsend (H). Lagorgendière: Romaine, mossy ledge, C. No. 90,196. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen (H). Brest: Blanc-Sablon, on the gneiss plain in bogs, M. L. Fernald and K. M. Wiegand, No. 2,734 (H).

[*E. vaginatum* L.] *E. callitrix*.

[*E. capitatum* Host.] *E. callitrix*.

E. gracile Roth. Listed by M. L. Fernald, Rhodora, xiii, 123 (1911), as growing in the bogs at Blanc-Sablon.

E. tenellum Nutt. Listed by M. L. Fernald, Rhodora, xiii, 123 (1911), as growing in the bogs at Blanc-Sablon.

E. angustifolium Roth. Archipel du Petit-Mécatina: Harrington, bog on rocky crest, C. No. 90,197 (immature). Brest: Blanc-Sablon, on the gneiss plain in boggy spots, M. L. Fernald and K. M. Wiegand, No. 2,745 (H).

E. angustifolium, var. *majus* Schultz. In bogs or tundra, throughout. Lagorgendière: Romaine, tundra, C. No. 90,199. Charnay: pointe au Maurier, edge of bog in tundra, C. No. 90,198.

E. virginicum L. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q); Mingan, pond shore, region of granite hills, C. No. 90,200. Natashkwan: sphagnum bog, C. No. 90,201; Natashkwan river, C. W. Townsend (H).

Rynchospora alba (L.) Vahl. Rare, bogs in the Laurentian area, as far east as Natashkwan. Mingan: Natashkwan river, C. W. Townsend (H). Natashkwan: sphagnum bog, C. No. 90,201.

Carex projecta Mackenzie. Thickets in valleys of larger rivers. Rivière Pentecôte: D. N. Saint-Cyr (called *C. cristata* Schk., v. *mirabilis* Boott) (Q). Natashkwan river: C. W. Townsend (H). St. Augustin river: alder thicket on isle in river, C. No. 90,202.

C. pratensis Drejer. Phelypeaux: baie du Milieu (Middle bay), J. A. Allen (H and Hb. Conn. Agric. Exp. Sta., New Haven).

[*C. cristata* Schk., var. *mirabilis* Boott] of D. N. Saint-Cyr is *C. projecta*.

C. Bebbii Olney. Mingan seigniory: Betchouane, grassy shore, C. No. 90,203 (H).

C. ænea Fernald. Mingan seigniory: Mingan river, D. N. Saint-Cyr (called *C. adusta* Boott) (Q).

[*C. adusta* Boott] of D. N. Saint-Cyr is *C. ænea*.

C. gynocrates Wormsk. Mingan islands and adjacent mainland, marl bogs. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H), and swampy brookside, C. No. 90,205. Mingan islands: île Ste. Geneviève, open bog, C. No. 90,204.

C. exilis Dewey. Lagorgendière: Romaine, edge of pond in tundra, C. Nos. 90,206 and 90,207.

C. echinata Murr. Reported from Mingan river, D. N. Saint-Cyr, July 16, 1882. Specimen not seen.

C. echinata, var. *angustata* (Carey) Bailey. Petite rivière Coxipi: swampy brookside, C. No. 90,208.

[*C. sterilis* Willd.] Recorded from Mingan islands: St. Charles island, July 22, 1882, D. N. Saint-Cyr. Specimen not seen, but is probably *C. echinata*.

C. scirpoides Schk. Brest: Blanc-Sablon, boggy spots on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,781 (H); Blanc-Sablon, and mossy brookside, C. No. 90,209.

[*C. canescens* L.] Recorded from St. Paul by W. A. Stearns (S¹) probably is one of the following varieties.

C. canescens, var. *subloliacea* Laestad. Natashkwan: edge of slough in sand dunes, C. No. 90,210.

C. canescens, var. *disjuncta* Fernald. Meadows, thickets, and borders of woods, very common throughout. Lagorgendière: Romaine, edge of woods, C. Nos. 90,211 and 90,212. Archipel de St. Augustin: Bayfield island, grassy brookside, C. No. 90,213.

[*C. canescens*, var. *vitis* Gray.] Recorded from Mingan islands: St. Charles island, D. N. Saint-Cyr. The cover so labelled contains a plant, var. *disjuncta*, which is said to have come from Watshishu.

C. brunnescens Poir. Bogs, meadows, and edge of woods, very common, throughout. Ile Ouapitagone: tundra, C. No. 90,214. Brest: Blanc-Sablon, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,793 (H).

C. tenuiflora Wahl. Brest: Blanc-Sablon, boggy margins of ponds on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,796 (H).

C. tenuiflora Wahl. \times *C. trisperma* Dewey. Brest: Blanc-Sablon, in boggy shore, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,797 (H).

C. trisperma Dewey. Bogs and wet thickets, very common throughout. Mingan seignior: Watshishu, D. N. Saint-Cyr (Q). Brouague: Shekatika river, mossy evergreen woods, C. No. 90,218. Brest: on the gneiss plain, in boggy spots, M. L. Fernald and K. M. Wiegand, No. 2,800 (H).

[*C. glareosa* Wahl.] of D. N. Saint-Cyr is the var. *amphigena* Fernald.

C. glareosa Wahl., var. *amphigena* Fernald. Rocks and marshy shores, general along the coast. Mingan seignior: Watshishu, D. N. Saint-Cyr (called *C. glareosa* Wahl.) (Q). Archipel Washicoutai: île Triple, cleft in rocks, C. No. 90,220. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 22 (H). Brest: Blanc-Sablon, on the gneiss plain, in wet spots, M. L. Fernald and K. M. Wiegand, No. 2,805 (H).

C. norvegica Willd. Wet shores, generally distributed. Charnay: pointe au Maurier, edge of pond on island off, C. No. 90,222. Phelypeaux: baie du Milieu, J. A. Allen (H). Brest: Blanc-Sablon, brackish shore, M. L. Fernald and K. M. Wiegand, No. 2,802 (H).

C. tenella Schk. Mingan islands: île Ste. Geneviève, boggy thicket, C. No. 90,223. Brest: on the gneiss plain, in boggy spots, M. L. Fernald and K. M. Wiegand, No. 2,807 (H).

C. diandra Schrank. Brest: Blanc-Sablon, wet boggy shores of pools, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,810 (H).

C. stipata Muhl. Mingan seigniory: Pointe-aux-Esquimaux, marshy brookside, C. No. 90,224.

C. chordorrhiza Lf. Brest: Blanc-Sablon, margins of bog-ponds, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,815 (H).

C. maritima O. F. Müller. Wet or dry shores, common all along the coast. Mingan seigniory: Quetachu, Manikuagan, D. N. Saint-Cyr (Q). Pontchartrain: Vieux-Fort, sea strand, C. No. 90,226.

C. salina Wahl., var. *lanceata* (Dewey) Kükenthal. Charnay: pointe au Maurier, sandy border of tidal pool, C. No. 90,228. Boishébert: baie des Moutons, salt marsh, C. No. 90,229.

C. salina, var. *kattogatensis* (Fries) Almq. Wet shores, fresh or brackish, common throughout. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Archipel de Kécarpoui: île du Petit Rigolet, salt marsh, C. No. 90,231. Brest: Blanc-Sablon, on the gneiss plain in wet places, M. L. Fernald and K. M. Wiegand, Nos. 2,818, 2,819, and 2,822.

C. subspathacea Wormskj. Salt marshes, general along the coast. Archipel Ouapitagone: Romaine, salt marsh, C. No. 90,234. This is the first record for this species in America south of Greenland, and Hudson bay.

C. aquatilis, Wahlenb. Fresh or brackish shores, general. Charnay: pointe au Maurier, edge of pool in tundra, C. No. 90,235. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 8 (H). Brest: Blanc-Sablon, on the gneiss plain in wet places, M. L. Fernald and K. M. Wiegand, No. 2,829 (H).

C. aquatilis, var. *cuspidata* Laestad. Mingan river: D. N. Saint-Cyr (called *C. vulgaris* Fries) (Q). Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen (called *C. aperta*, var. β Boott), (Hb. Conn. Agric. Exp. Sta., New Haven).

[*C. vulgaris* Fries] *C. aquatilis*, var. *cuspidata*.

C. rigida Good. Archipel du Petit-Mécatina: Harrington, bog on rocky crest, C. No. 90,239. Archipel du Vieux-Fort: île Herbée, grassy summit, C. No. 90,238.

C. lenticularis Michx. Damp open spots, general. Natashkwan: wet dune hollow, C. No. 90,240. Eskimo river: J. A. Allen, No. 17 (H). Brest: Blanc-Sablon, abundant on boggy or sandy margins of pools, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,835 (H). Southern Labrador: Storer (H).

[*C. Goodenowii* J. Gay.] Plant so labelled from Natashkwan river: C. W. Townsend (H). It is a young spray, tall and apparently leafy. It might equally well be *C. lenticularis*.

C. aurea Nutt. Mingan islands: île Ste. Geneviève, muddy shore, D. N. Saint-Cyr (Q).

[*C. aurea*, var. *androgyna* Olney] of D. N. Saint-Cyr is *C. aurea*.

C. pauciflora Lightf. Bogs and tundra, general. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Lagorgendière: Romaine, tundra, C. No. 90,241. Brest: Blanc-Sablon, on the gneiss plain in bogs, M. L. Fernald and K. M. Wiegand, No. 2,848 (H).

C. leptalea Wahlenb. Mingan islands and strait of Belle Isle, wet thickets or meadows. Mingan islands: île Ste. Geneviève, boggy thicket, C. No. 90,242; île à la Chasse, pond shore, C. No. 90,243. Brest: Blanc-Sablon, on the gneiss plain in wet moss, M. L. Fernald and K. M. Wiegand, No. 2,850 (H); Blanc-Sablon, and grassy brookside, C. No. 90,244.

C. Halleri Gunn. Brest: Blanc-Sablon, by streams, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,852 (H).

C. atrata L., var. *ovata* (Rudge) Boott. Region of Mingan islands, and the strait of Belle Isle, meadows. Mingan seigniory: Betchouane, meadow, C. No. 90,245. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, Nos. 2,854 and 2,855 (H).

C. stylosa C. A. Meyer. Boggy spots, general, Ile Petit-Mécatina: cold, shaded cleft in rocks, C. No. 90,247. Brest: Brador and Blanc-Sablon, forming depressed mats on sand, M. L. Fernald and K. M. Wiegand, Nos. 2,941 and 2,942 (H).

C. scirpoidea Michx. Brest: anse des Dunes, sandy pond shore, C. No. 90,248.

C. umbellata Schk., var. *brevirostris* Boott. Natashkwan: sand dunes, C. No. 90,249.

C. deflexa Hornem. Occasional as far east as Shekatika, dry thickets and edges of dry woods. Mingan islands: Eskimo island, D. N. Saint-Cyr (called *C. novæ-angliæ* Schw.) (Q). Ile Petit Mécatina: rocky summit, C. No. 90,250. Brouague: near Indian camp on dry hillside, C. No. 90,252.

[*C. novæ-angliæ* Schw.] *C. deflexa*.

C. livida (Wahl.) Willd. Bogs and tundra, apparently throughout. Lagorgendière: Romaine, edge of pond in tundra, C. No. 90,253.

C. vaginata Tausch. Mingan islands, and strait of Belle Isle, wet thickets. Mingan islands: île du Havre, Mingan, D. N. Saint-Cyr (Q); Eskimo island, swampy woods, C. No. 90,254; île Ste. Geneviève, boggy thicket, C. No. 90,255. Brest: Blanc-Sablon, in boggy spots on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,871 (H).

C. paupercula Michx. Bogs and tundra, common throughout. Seven Islands: C. B. Robinson, No. 927 (H). Rivière au Tonnerre: D. N. Saint-Cyr (Q). Lagorgendière: Romaine, tundra, C. No. 90,259. Boishébert: baie des Moutons, sphagnum bog, C. No. 90,258.

[*C. irrigua* Smith.] Reported by D. N. Saint-Cyr. Specimen not seen, is probably *C. paupercula* Michx.

C. limosa L. Bogs and tundra, common throughout. Charnay: pointe au Maurier, wet tundra, C. No. 90,260. Brest: Blanc-Sablon, on the gneiss plain, in boggy spots, M. L. Fernald and K. M. Wiegand, No. 2,878 (H).

C. rariflora Sm. Bogs and tundra, extremely abundant throughout. southern Labrador: Storer (H). Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Lagorgendière: Romaine, tundra, C. No. 90,263. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 18 (H). Brest: Blanc-Sablon, on the gneiss plain, in boggy or sandy soil, M. L. Fernald and K. M. Wiegand, No. 2,885 (H).

C. eburnea Boott. Region of Mingan islands. Mingan river: sable, D. N. Saint-Cyr (Q). Mingan islands: Eskimo island, damp limestone cliffs, C. No. 90,264, and île Ste. Geneviève.

C. concinna R. Br. Region of Mingan islands. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: île à l'Ancre, D. N. Saint-Cyr (Q); île Ste. Geneviève, limestone rocky banks, C. No. 90,265.

C. flava L. Mingan islands: île Ste. Geneviève, boggy thicket, C. No. 90,266. Collection of D. N. Saint-Cyr is the var. *elator*.

C. flava, var. *elator* Schlecht. Rivière Pentecôte: D. N. Saint-Cyr, may come from within the area, although the mouth of the river is beyond the boundary line (Q). Mingan islands: île à la Chasse, boggy pond shore, C. No. 90,267.

C. Æderi Retz., var. *pumila* (Coss. and Germ.) Fernald. Mingan seigniory: Betchouane, boggy shore, C. No. 90,268.

C. capillaris L. Mingan islands and strait of Belle Isle, and one station between, on an exposed outer island, abundant at, turfy headlands and limestone cliffs. Mingan islands: Eskimo island, D. N. Saint-Cyr (Q); St. Charles island, D. N. Saint Cyr (mixed with *Catabrosa aquatica*) (Q). Mingan seigniory: Pointe-aux-Esquimaux, rocky limestone headland, C. No. 90,270. Archipel Ouapitagone: Romaine, forming turf on island, C. No. 90,269. Brest: pointe à Peau, dry turf, C. No. 90,271.

C. capillaris, var. *elongata* Olney. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, by brooks, M. L. Fernald and K. M. Wiegand, No. 2,919 (H).

C. oligosperma Michx. Bogs and pond shores, occasional, as far east as Shekatika. Rivière au Tonnerre: D. N. Saint-Cyr (Q). Mingan seigniory: Mingan, tundra, C. No. 90,275; Pointe-aux-Esquimaux, edge of pond in tundra, C. No. 90,272. Legardeur: Coacoachou, marshy brookside, C. No. 90,274. Brouague: Petite rivière Coxipi, sphagnum bog, C. No. 90,273.

C. saxatilis L., var. *rhomalea* Fernald. Abundant at the strait of Belle Isle. Brest: Blanc-Sablon, sandy pond shores, M. L. Fernald and K. M. Wiegand, Nos. 2,954 and 2,956, and 2,957 (H), and C. Nos. 90,276 and 90,277.

C. saxatilis, var. *rhomalea* × *C. vesicaria* L. Rivière Pentecôte: D. N. Saint-Cyr (called *C. militaris*) (Q). Natashkwan: border of slough in sand dunes, C. No. 90,278. Brest: sandy pond shore, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 2,963 (H).

C. vesicaria L. Chevalier: St. Paul, tussocks in swale, C. No. 90,279.

C. vesicaria L., var. *distenta* Fries. Natashkwan: wet dune hollow, C. No. 90,280.

C. (hybrid?). A plant with empty perigynia, a probable hybrid, differing from the *C. vesicaria* group in not having several staminate spikes. Lagorgendière: Romaine, tussock on grassy shore, C. No. 90,225.

C. rostrata Stokes, var. *utriculata* (Bcott) Bailey. Mingan islands: île du Havre, grassy brookside, C. No. 90,281.

ARACEÆ (ARUM FAMILY)

Calla palustris L. Natashkwan: slough in sand dunes, C. No. 90,282.

LEMNACEÆ (DUCKWEED FAMILY)

Lemna minor L. Small ponds on two outer, rocky islands near Romaine. Archipel Washicoutai: île Triple, filling tiny pool in rocks, C. No. 90,283. Archipel Ouapitagone: l'île au God, filling small pools, C. No. 90,284. This plant is known at Bic on Gaspé peninsula, and on Magdalen islands. F. Hegelmaier, Syst. Übersicht der Lemnaceæ, Engler. Bot. Jahrb., xxi, 292 (1895) records this from "Hudsonbai-Länder (R. Brown)."

ERIOCAULACEÆ (PIPEWORT FAMILY)

Eriocaulon septangulare With. Shallow pools, occasional, as far east as Shekatika. Mingan seigniory: Mingan, pool in tundra, C. No. 90,286. Brouague: Petite rivière Coxipi, in one foot of water, sandy-bottomed pool, C. No. 90,285.

JUNCACEÆ (RUSH FAMILY)

JUNCUS BUFONIUS L. Sparingly introduced, not spreading from the settlements. Reported from rivière au Tonnerre, D. N. Saint-Cyr. Specimen not seen. Pointe-aux-Esquimaux. Lagorgendière: Romaine, wet sand, C. No. 90,288. Chevalier: St. Paul, path, C. No. 90,287. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen.

J. trifidus L. Rocky crests in the Laurentian area, general. Île Ouapitagone: rocky crest, C. No. 90,289. Archipel de St. Augustin: Bayfield island, C. No. 90,290.

J. Vaseyi Engelm. Natashkwan: sand dunes, C. No. 90,291, and Shekatika. Also found in Keewatin, see H. H. Bartlett, Rhodora, xi, 155 (1909).

[*J. effusus* L.] Recorded from rivière Pentecôte, Ragged island, and Mingan islands, by D. N. Saint-Cyr. The cover containing the sheets is labelled, Levis and rivière Pentecôte. Within are five sheets, some of *J. effusus* and some not. One has a loose ticket, Levis, and the others no data. This material has too little authentic data capable of interpretation to serve as the only record of the plant from the coast.

J. filiformis L. Grassy shores, occasional throughout. Pontchartrain: Vieux-Fort, wet grassy shore, C. No. 90,293. Brest: Jones point, sandy border of pond, C. No. 90,292.

[*J. balticus* Willd.] of D. N. Saint-Cyr is the var. *littoralis*.

J. balticus Willd., var. *littoralis* Engelm. Mingan islands, on brackish shores, and marshes: D. N. Saint-Cyr (called *J. balticus*) (Q). Charnay: pointe au Maurier, brackish marsh, C. Nos. 90,294 and 90,295. Brest: Blanc-Sablon, sandy brackish shore, M. L. Fernald and K. M. Wiegand, No. 2,991 (H).

J. balticus Willd., var. *melanogenus* Fernald and Wiegand. Brest: Brador, sand dunes, M. L. Fernald and K. M. Wiegand, No. 2,992 (type in H).

J. brevicaudatus (Engelm.) Fernald. Wet places, occasional. Mingan seigniory: Pointe-aux-Esquimaux, marshy brookside, C. No. 90,296. Charnay: pointe au Maurier, muddy brookside, and fundra, C. Nos. 90,298 and 90,297. Ile Gros-Mécatina: wet mud, C. No. 90,299. Brest: Blanc-Sablon, local in wet places, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,003 (H).

J. pelocarpus Meyer. Pointe-aux-Esquimaux, and Natashkwan: marshy pond shore, C. No. 90,300.

J. subtilis Meyer. Mingan seigniory: Mingan river, sand bar in, C. No. 90,301.

J. alpinus Vill., var. *insignis* Fries. Mingan seigniory: Mingan river, sand flat in, C. No. 90,302.

J. triglumis L. Brest: Longue pointe, mossy turf, C. No. 90,303.

Luzula parviflora Desv. Grassy borders of woods, occasional throughout. Brouague: Petite rivière Coxipi, sunny open bank, C. No. 90,304. Reported "on hills," by S. R. Butler (B⁵).

L. parviflora, var. *melanocarpa* (Michx.) Buchenau. Boggy woods, common on Mingan islands and strait of Belle Isle, occasional elsewhere. Rivière au Tonnerre: D. N. Saint-Cyr (called *E. spadicea* DC., var. *parviflora* Desv.) (Q). Mingan islands: île du Havre, swampy woods, C. No. 90,306; Eskimo island, boggy woods, C. No. 90,305. Brest: Blanc-Sablon, limestone and calcareous sandstone tablelands, M. L. Fernald and K. M. Wiegand, No. 3,049 (H).

[*L. spadicea* DC., var. *parviflora* Desv.] *L. parviflora*.

L. confusa Lindeb. Brest: rivière à la Truite, turfey crest of granite hills, C. No. 90,307.

L. spicata (L.) DC. Brest: rivière à la Truite, grassy hollow between granite cliffs, C. No. 90,308; Blanc-Sablon, abundant in sand blows, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,051 (H).

L. campestris (L.) DC., var. *multiflora* (Ehrh.) Celak. Pontchartrain: Vieux-Fort, grassy shore, C. No. 90,309.

L. campestris, var. *frigida* Buchenau. Archipel du Blanc-Sablon: Greenly island, J. A. Allen (in Hb. Conn. Exp. Sta., New Haven). Brest: Jones point, hillside turfey, C. No. 90,310; Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,057 (H).

LILIACEÆ (LILY FAMILY)

Tofieldia minima (Hill) Druce. Limestone cliffs and mossy banks, common in the region of Mingan islands. Mingan islands: D. N. Saint-Cyr (Q); Eskimo island, wet limestone sea-cliff, C. No. 90,311.

T. glutinosa (Michx.) Pers. Mingan islands: July, 1882, D. N. Saint-Cyr (Q). It is known also on Anticosti.

Zigadenus chloranthus Richardson. Limestone shingle beaches and sea-cliffs, common in region of the Mingan islands. Mingan islands: Eskimo island, top of limestone shingle, C. No. 90,312; île Ste. Geneviève, top of limestone strand, C. No. 90,313.

ALLIUM SCHOENOPRASUM L. Brest: Blanc-Sablon, escaped from cultivation, sandy sea strand, M. L. Fernald and K. M. Wiegand, No. 3,070 (H).

Clintonia borealis (Ait.) Raf. Mossy woods, very abundant throughout. Seven Islands: C. B. Robinson, No. 681 (H). Mingan seigniory: Mingan, C. W. Townsend (H). Lagorgendière: Romaine, mossy woods, C. No. 90,314. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,072 (H).

Smilacina stellata (L.) Desv. Sandy or turfy places, common throughout. Seven Islands: C. B. Robinson, No. 679 (called *Vagnera stellata*) (H). Mingan seigniory: Mingan, C. W. Townsend (H). St. Vincent: rivière Netagamou, sand dunes at mouth of, C. No. 90,315. Brest: Blanc-Sablon, sandy strand, M. L. Fernald and K. M. Wiegand, No. 3,075 (H).

S. trifolia (L.) Desv. Bogs, tundra, and wet woods, extremely common throughout. Seven Islands: C. B. Robinson, No. 891 (H). Natashkwan river: C. W. Townsend (H). Lagorgendière: Romaine, tundra, C. No. 90,316.

[*S. bifolia* Ker.] *Maianthemum canadense*.

Maianthemum canadense Desf. Turfy or mossy banks, borders of woods, common throughout. Mingan seigniory: Mingan, C. W. Townsend (H). Ile Petit Mécatina: mossy bank, C. No. 90,317.

Streptopus amplexifolius (L.) DC. Mossy woods, common throughout. Southern Labrador, Storer (H). Mingan islands: D. N. Saint-Cyr (Q). Archipel du Petit-Mécatina: Harrington, cold ravine, C. No. 90,319. Brest: Blanc-Sablon, limestone and calcareous sandstone tablelands, M. L. Fernald and K. M. Wiegand, No. 3,079 (H).

S. roseus Michx. Mossy woods general, but not abundant. Seven Islands: C. B. Robinson, No. 753 (H). Mingan seigniory: Mingan, C. W. Townsend (H). Lagorgendière: Romaine, wooded river bank, C. No. 90,322. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,080 (H).

IRIDACEÆ (IRIS FAMILY)

Iris versicolor L. Grassy borders of streams and ponds, general. Seven Islands: C. B. Robinson, No. 872 (H). Brest: Jones point, grassy brookside, C. No. 90,324; Blanc-Sablon, abundant in wet spots on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,085 (H).

I. setosa Pall., var. *canadensis* Foster. Rocky, gravelly, or turfy shores near the sea, very abundant. Collected by C. B. Robinson, Dr. Bryant, Storer, D. N. Saint-Cyr, and Fernald and Wiegand.

[*I. tridentata* Pursh] of D. N. Saint-Cyr is *I. setosa* var. *canadensis*.

Sisyrinchium angustifolium Mill. Occasional as far east as Natashkwan. St. Charles island; Betchouane and Natashkwan: sand dunes, C. No. 90,327.

ORCHIDACEÆ (ORCHIS FAMILY)

Cypripedium parviflorum Salisb. Abundant in the calcareous region of Mingan islands: D. N. Saint-Cyr (called *C. pubescens* Willd.); Verrill,

Hyatt, and Shaler (Y); Eskimo island, limestone sea-cliffs, C. No. 90,330; reported from Grande île, J. Richardson (R¹); île Ste. Geneviève, top of limestone shingle, C. No. 90,328. Mingan seigniory: Betchouane, edge of woods, C. No. 90,329.

[*C. pubescens* Willd.] of D. N. Saint-Cyr is *C. parviflorum*.

C. acaule Ait. Dry woods, occasional, as far east as Shekatika. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Brouague: Petite rivière Coxipi, dry mossy hillside, C. No. 90,331. In Dr. Wm. Kelly's manuscript list (called *C. humile*).

Orchis rotundifolia Pursh. Mingan islands: limestone cliffs, Verrill, Hyatt, and Shaler (called *Platanthera rotundifolia* Lindl.) (Y); D. N. Saint-Cyr (called *Habenaria rotundifolia* Richards.) (Q); Eskimo island, calcareous talus, C. Nos. 90,332 and 90,333.

[*Platanthera rotundifolia* Pursh] of A. E. Verrill is *Orchis rotundifolia*.

[*Habenaria rotundifolia* Richards.] of D. N. Saint-Cyr is *Orchis rotundifolia*.

Habenaria hyperborea (L.) R. Br. Pointe-aux-Esquimaux. Mingan islands: île du Havre, D. N. Saint-Cyr (Q). Reported by S. R. Butler (B⁵) "in swamps and on hillsides." In Dr. Wm. Kelly's manuscript list (called *Orchis hyp.*).

H. dilatata (Pursh) Gray. Common in region of Mingan islands, and the strait of Belle Isle, bogs and swampy woods; infrequent elsewhere; île du Havre; Betchouane: île à la Chasse; Ste. Geneviève; Natashkwan. Reported by S. R. Butler (B⁵) "in swamps and on hillsides." Brest: Blanc-Sablon, grassy brookside, C. No. 90,334.

H. obtusata (Pursh) Richards. Mossy woods, very common throughout. Also collected by C. W. Townsend, C. B. Robinson, D. N. Saint-Cyr, and Fernald and Wiegand. Reported by S. R. Butler (B⁵).

[*H. psycodes* (L.) Sw.] Recorded from Mingan islands: île du Havre, August 15, 1882. The cover containing the plant is labelled île d'Orleans, July, 1883. A loose ticket under the plant says "prés humides, île du Havre, July 31, 1882, No. 627c." The plant is common in Gaspé and western Newfoundland, and in spite of the confused data, this record seems credible.

[*Spiranthes gracilis* Bigel.] Recorded from Little Mingan river, August 24, 1882, D. N. Saint-Cyr. Specimen not seen.

Spiranthes Romanzoffiana Cham. Moist places, region of Mingan islands and the strait of Belle Isle, and two other stations. Seven Islands: C. B. Robinson (C). Mingan: île du Havre; île à la Chasse; île Ste. Geneviève; Natashkwan; and Brest: anse des Dunes, grassy hollow, C. No. 90,336.

Epipactis repens (L.) Crantz, var. *ophioides* (Fernald) A. A. Eaton. Deep woods, occasional. Seven Islands: C. B. Robinson (C). Mingan seigniory: Mingan, mossy woods, C. No. 90,338. St. Augustin river: mossy, evergreen woods, C. No. 90,337.

[*Peramium ophioides* (Fernald) Rydb.] *Epipactis repens*, var. *ophioides*.

Listera cordata (L.) R. Br. Mossy woods, occasional, throughout. Goynish: îles Boisées de cap Blanc, Washtawouka, mossy, evergreen woods, C. No. 90,340. Brouague: Shekatika river, mossy, evergreen woods, C. No. 90,339.

L. convallarioides (Sw.) Torr. Mingan islands: île Quin, D. N. Saint-Cyr (Q).

Corallorhiza trifida Chatelain. Region of Mingan islands, rich woods. Mingan, Betchouane, and Mingan islands: Eskimo island, mossy woods, C. No. 90,341; île Ste. Geneviève, edge of woods, C. No. 90,342.

Microstylis monophyllos (L.) Lindl. Reported from Archipel du Vieux-Fort; Bonne-Espérance, damp ground, concealed by short grass, W. A. Stearns (S¹). Fernald and Wiegand found this on the Labrador side of the strait of Belle Isle.

Calypso bulbosa (L.) Oakes. Mingan islands: calcareous slopes, Verrill, Hyatt, and Shaler (Y); D. N. Saint-Cyr (Q); Eskimo island, mossy woods at base of limestone cliff, C. Nos. 90,343 and 90,344, and C. W. Townsend (H); île à la Chasse, C. W. Townsend (H).

[*C. borealis* Sal.] is *C. bulbosa*.

SALICACEÆ (WILLOW FAMILY)

[*Salix nigra* Marsh.] Reported "general in southern part" S. R. Butler (B⁵). Improbable.

Salix lucida Muhl. Mingan and St. Augustin river: sandy bank in river, C. No. 90,349. Brest: rivière Blanc-Sablon, along, M. L. Fernald and K. M. Wiegand, No. 3,146 (H).

S. lucida, var. *intonsa* Fernald. Natashkwan river: C. W. Townsend (H). Lagorgendière: Romaine, river bank, C. No. 90,350.

S. discolor Muhl. Wet thickets and borders of woods, common on Mingan islands: top of calcareous shingle, and swampy woods, trees 30 feet in height, 6 inches in diameter, C. Nos. 90,346, 90,347, and 90,348; île Ste. Geneviève, wooded bank, C. No. 90,345.

[*S. rostrata* Richards.] At Mingan, C. W. Townsend collected young staminate material which may well be this. The catkin is like those of *S. rostrata*, but the leaves look as if they might become glabrate.

S. argyrocarpa Anderss. Ledges and rocky hilltops in the Laurentian area, Shekatika east to the strait of Belle Isle. Brouague: Shekatika river, bank of, C. No. 90,352. St. Augustin river: sandy isle in river, C. No. 90,351. Brest: Blanc-Sablon, wet hollows on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 4,240 (H); rivière Blanc-Sablon, edge of, C. No. 90,353.

S. humilis Marsh. Thickets, apparently throughout. Seven Islands: D. N. Saint-Cyr (Q). Natashkwan river: C. W. Townsend (H). Boishébert: baie des Moutons, wooded hillside, C. No. 90,354.

S. humilis × *S. phylicifolia* L. Boishébert: baie des Moutons, wooded hillside, common, C. No. 90,356.

S. phylicifolia L. Forming thickets on brooksides and river banks, throughout. Southern Labrador: Storer (H). Natashkwan river: C. W. Townsend (H). C. Nos. 90,357-90,368.

S. adenophylla Hook. Natashkwan river: C. W. Townsend, July 24 to August 10, 1912 (H). This corresponds exactly to Hooker's description, to the description and plate of Andersson, *Monographia Salicum*, 164 and Pl. viii, F. 95 (1863) which were drawn from the type specimen, and to a tracing of the type made by Mr. S. F. Blake for the Gray herbarium. This is the second record for the plant, the first being the type, Labrador: Dr. Morrison. This plant is quite distinct from *S. syrticola* Fernald of the Great Lakes region which has been confused with it.

S. cordata Muhl. St. Augustin river: muddy river bank, C. No. 90,369. This is the sterile plant with broadly lanceolate leaves, and white canescent twigs that is common in the northern part of the range of the species.

S. pyrifolia Anderss. Natashkwan: edge of slough in sand dunes, C. No. 90,370.

S. candida Flügge. Brookside and meadows, common in the calcareous region of Mingan islands and strait of Belle Isle. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: in part, D. N. Saint-Cyr (Q); île à la Chasse, pond shore, C. No. 90,372. Brest: Jones point, grassy brookside, C. No. 90,374; and Blanc-Sablon, common by brooks, limestone and calcareous sandstone table lands, M. L. Fernald and K. M. Wiegand, No. 3,180 (H).

S. pellita Anderss. St. Augustin river: sandy isle in river, C. No. 90,373. Brest: Jones point, grassy brookside, C. No. 90,374; rivière Blanc-Sablon, large shrubs along, M. L. Fernald and K. M. Wiegand, No. 3,182 (H).

S. cordifolia Pursh. Common at Mingan islands and less frequent eastward.

S. cordifolia f. *hypoprionota* Schneider. Mingan islands: île Ste. Geneviève, limestone rocky bank, C. No. 90,840.

S. anglorum Cham. Archipel du Vieux-Fort: Bonne-Espérance, wet place, J. A. Allen (Hb. Field Museum).

[*S. alpestris* Anderss.] Recorded from Tabatière, 1858, J. B. A. Berland (B¹). Probably is *S. cordifolia*.

S. Uva-ursi Pursh. Exposed ledges in the Laurentian area. Baie des Moutons. Brest: rivière à la Truite, rocky ledges and turf summit, C. Nos. 90,375 and 90,376; Blanc-Sablon, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,169 (H).

S. vestita Pursh. Calcareous region of Mingan islands and the strait of Belle Isle. Mingan islands: Eskimo island, limestone sea-cliffs, C. No. 90,377; Verrill, Hyatt, and Shaler (called *S. reticulata* L., var. *vestita* Anderss.) (Y). Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H).

S. vestita, var. *psilophylla* Fernald and St. John. Mingan islands: Eskimo island, limestone sea-cliffs, C. No. 90,378.

[*S. reticulata* L., var. *vestita* Anderss.] *S. vestita*.

Populus tremuloides Michx. Reported from Seven Islands, C. B. Robinson (R²). Mingan seigniory: Mingan, C. W. Townsend (H); 3 miles up Mingan river, C. No. 90,379. R. Bell indicates this on his map (B⁴) as growing over the greater part of Labrador peninsula. It does not, however, grow in the coastal region east of Mingan.

[*P. grandidentata* Michx.] R. Bell indicates on his map (B⁴) that this grows in the southern part of the peninsula. There seems to be no evidence of its being in the coastal region.

P. balsamifera L. Drier woods on calcareous region of Mingan islands: Eskimo island, edge of mossy woods, C. No. 90,380. Mingan seigniory: Mingan, C. W. Townsend (H). Also at île du Havre, Pointe-aux-Esquimaux, and Betchouane. R. Bell shows (B⁴) this is of general distribution in the southern part, but this does not seem to be the case.

MYRICACEÆ (SWEET GALE FAMILY)

Myrica Gale L. Bogs, tundra, and thickets, extremely abundant throughout. Also collected by C. W. Townsend, C. B. Robinson, and reported by Miss Macfarlane (B⁵).

BETULACEÆ (BIRCH FAMILY)

[*Betula populifolia* Ait.] Reported by W. A. Stearns (S¹) "Very abundant, everywhere in the woods and on side hills. An abortive tree seldom over 20 feet high here." This is obviously a misidentification. The tree is probably *B. alba* or some variety of it.

Betula alba L. Mingan seigniory: Betchouane, hillside, C. No. 90,824. Mingan islands: Eskimo island, C. W. Townsend (H).

B. alba, f. *occidentalis* (Hook.) Fernald. Very common throughout, forming large forests in the river valleys. Ile Petit Mécatina: tree 30 feet high, 1 foot in diameter, in a sheltered cove by a lake, C. No. 90,825. Although transitions occur in some places, especially the sheltered river valleys, most of the trees examined had the dark brown bark that is given as the character of f. *occidentalis*.

B. alba, var. *cordifolia* (Regel) Fernald. Common throughout. Boishébert: baie des Moutons, wooded hillside, C. No. 90,829. In this variety also occur two phases, one with chalky white bark and the other with dark silvery brown bark, such as archipel de St. Augustin: île des Génévriers, sheltered valley, tree 1 foot in diameter, 20 feet high, C. No. 90,827.

B. alba, var. *carpatica* (W. and K.) Fernald. Thickets, as far east as Piashti bay. Mingan islands: île Ste. Geneviève, limestone sea-cliffs, C. No. 90,830.

[*B. papyracea* Ait.] Probably is *B. alba*, var. *cordifolia* or f. *occidentalis*.

B. microphylla Bunge. Rocky places in the Laurentian area. Seven Islands: C. B. Robinson, No. 867 (called *B. glandulosa* Michx.). Mingan seigniory: Mingan, granite hills, C. No. 90,384. Charnay: pointe au Maurier, 4 feet high, on rocky crest, C. No. 90,385.

[*B. nana* L.] reported by S. R. Butler (B⁵), is undoubtedly *B. Michauxii*.

B. Michauxii Spach. Tundra and pond margins, abundant and generally distributed. Natashkwan river: arctic plain, C. W. Townsend (H). Lagorgendière: Romaine, tundra, C. No. 90,386. Brest: Blanc-Sablon, margins of bog ponds, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,269 (H).

B. pumila L. Edge of bogs, thickets and turfy hills, abundant, and general. Also collected by J. A. Allen, C. W. Townsend, and D. N. Saint-Cyr. Reported (B⁵) as collected by Miss Macfarlane.

B. glandulosa Michx. Thickets and hillsides, especially in the Laurentian area, general. Seven Islands: C. B. Robinson (H). Mingan islands: D. N. Saint-Cyr (Q). Archipel du Vieux-Fort: île Herbée, tundra, C. No. 90,832.

B. glandulosa, var. *sibirica* (Ledeb.) Blake. Occasional throughout. Mingan seigniory: Mingan, C. W. Townsend (H). Chevalier: St. Paul, edge of thicket, C. No. 90,391. Brest: Blanc-Sablon, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,267 (H).

Alnus crispa (Ait.) Pursh. Damp shores, occasional. Seven Islands: C. B. Robinson, No. 684 (C and H). Archipel de Kécarpoui: île du Petit Rigolet, rocky shore, C. No. 90,392.

A. crispa, var. *mollis* Fernald. Shores and banks of water courses, extremely abundant, throughout. Archipel du Petit-Mécatina: Harrington, cold ravine, C. No. 90,394.

[*A. viridis* DC.] of D. N. Saint-Cyr is probably *A. crispa*, var. *mollis*.

[*A. viridis* DC.] recorded by W. A. Stearns (S¹), is probably *A. crispa*, var. *mollis*.

[*A. incana* Willd.] of R. Bell (B⁴) and D. N. Saint-Cyr is probably the var. *glauca*.

A. incana (L.) Moench., var. *glauca* Ait. Brookside and wet shores, common throughout. Seven Islands: C. B. Robinson, No. 900 (H). Mingan seigniory: brookside, Piashti bay, C. No. 90,395.

[*A. serrulata* Ait.] reported by W. A. Stearns (S¹). It is probably *A. incana*, var. *glauca*.

URTICACEÆ (NETTLE FAMILY)

Urtica gracilis Ait. Seven Islands: C. B. Robinson, No. 946 (C. and H).

U. Lyallii Wats. Rocky or grassy shores, general. Mingan islands: île du Havre (called *U. gracilis*) (Q). Mingan seigniory: Pointe-aux-Esquimaux, C. B. Robinson, No. 625 (called *U. gracilis*) (H); Piashti bay, rocky shore, C. No. 90,396.

SANTALACEÆ (SANDALWOOD FAMILY)

[*Comandra umbellata* Nutt.] All records of this belong with *C. Richardsiana*.

Comandra Richardsiana Fernald. Mingan islands: Verrill, Hyatt, and Shaler (called *C. umbellata*) (Y); D. N. Saint-Cyr (called *C. umbellata*) (Q).

C. livida Richardson. Turfy banks and borders of woods, common throughout. Seven Islands: C. B. Robinson (H). Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: Verrill, Hyatt, and Shaler (Y). Ile Petit Mécatina: mossy bank, C. No. 90,397.

POLYGONACEÆ (BUCKWHEAT FAMILY)

[*Oxyria digyna* (L.) Hill.] Erroneously recorded by J. Macoun (M) as collected on Caribou island by S. R. Butler. Neither Butler (B⁵) nor W. A. Stearns lists the species.

Rumex occidentalis Wats. Never far from sea, common all along the coast. Also collected by J. A. Allen; Storer; D. N. Saint-Cyr; Verrill, Hyatt, and Shaler.

[*R. domesticus* DC.] recorded by Verrill (V¹) is *R. occidentalis*.

R. Britannica L. Fresh marshes, eastward as far as Etamamiou. Ile du Havre; île Ste. Geneviève; Coacoachou; and Charnay; rivière Etamamiou, swale, C. No. 90,399.

R. mexicanus Meisn. Sea strands, eastward as far as Romaine. Mingan islands: D. N. Saint-Cyr (called *R. salicifolius* Wein.) (Q); île du Havre; île Ste. Geneviève. Coacoachou, and Lagorgendière: Romaine, sandy shore, C. No. 90,400.

[*R. salicifolius* Wein.] of D. N. Saint-Cyr is *R. mexicanus*.

R. ACETOSELLA L. Introduced at a number of places. Mingan seigniory: Sheldrake river, D. N. Saint-Cyr (Q); Pointe-aux-Esquimaux, C. B. Robinson, No. 651 (H). St. Vincent: rivière Netagamiou, sandy bank at mouth of, near camp, C. No. 90,401.

Polygonum Fowleri Robinson. Rocky shores, occasional from point au Maurier eastward to the strait of Belle Isle. Charnay: pointe au Maurier, rocky shore, C. No. 90,823. Iles Netagamiou, Harrington, and Boishebért: baie des Moutons, rocky shore, C. No. 90,822.

P. boreale (Lange) Small. Known only from Charnay: pointe au Maurier, dooryard, C. No. 90,820.

P. AVICULARE L. Introduced at numerous places. Chevalier: St. Paul, dooryard, C. No. 90,821.

P. viviparum L. Limestone cliffs and mossy headlands, from Mingan islands to the strait of Belle Isle. Mingan islands: D. N. Saint-Cyr (Q); Verrill, Hyatt, and Shaler (Y). Archipel du Vieux-Fort: île Herbée, rocky crest, C. No. 90,404. Brest: Blanc-Sablon, abundant on cool slopes, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 2,296 (H).

P. PENNSYLVANICUM L., var. *LÆVIGATUM* Fernald. Introduced. Mingan seigniory: Mingan, dooryard, C. No. 90,405.

P. arifolium L. Mingan seigniory: Sheldrake river, damp soil, August 24, 1882, D. N. Saint-Cyr (Q). This plant was not included in Saint-Cyr's published list.

P. SAGITTATUM L. Introduced. Mingan islands: Grande île, July 24, 1882. D. N. Saint-Cyr (Q).

P. CONVULVULUS L. Introduced. Mingan seigniory: rivière au Tonnerre, D. N. Saint-Cyr (called *P. scandens*) (Q); Pointe-aux-Esquimaux, cultivated field, C. No. 90,406.

[*P. scandens* L.] of D. N. Saint-Cyr is *P. Convolvulus*.

CHENOPODIACEÆ (GOOSEFOOT FAMILY)

CHENOPODIUM ALBUM L. Introduced. Mingan, Pointe-aux-Esquimaux, and Natashkwan: roadside, C. No. 90,407.

Atriplex patula L. Rocky shores of Mingan islands: île Ste. Geneviève, rocky limestone shore, C. No. 90,410. Phelypeaux: baie du Milieu (Middle bay), J. A. Allen (Hb. Conn. Agric. Exp. Sta., New Haven).

Record of D. N. Saint-Cyr is the var. *hastata*.

A. patula var. *hastata* (L.) Gray. Saline shores, all along the coast. Mingan islands: D. N. Saint-Cyr (called *A. patula* L.) (Q). Charnay: pointe au Maurier, marshy shore, C. No. 90,408. Archipel du Vieux-Fort: île Herbée, sea strand, C. No. 90,409.

Salicornia europæa L. Known only from Seven Islands: Old Fort river, C. B. Robinson, No. 716 (H).

Salsola Kali L. Mingan seigniory: Pointe-aux-Esquimaux, strand, C. No. 90,411.

CARYOPHYLLACEÆ (PINK FAMILY)

[*Spergularia rubra* (L.) J. and C. Presl.] Recorded by L. O. Brunet (B²) from "côte du Labrador, bord de la mer." Judging from the habitat given, this is probably *S. canadensis*.

S. canadensis (Pers.) Don. Brackish shores, occasional. Mingan islands: île Ste. Geneviève, rocky limestone shore, C. No. 90,412. Charnay: pointe au Maurier, gravelly shore, C. No. 90,413.

S. salina J. and C. Presl. Archipel du Vieux-Fort: Bonne-Espérance, sand of the seashore, J. A. Allen (Hb. Conn. Agric. Exp. Sta., New Haven).

Sagina procumbens L. Wet places, occasional from île Kécarpoui eastward to the strait of Belle Isle. Archipel du Blanc-Sablon: île Perroquets, wet turf, C. No. 90,414.

S. nodosa (L.) Fenzl. Rocky shores or sand flats, frequent as far east as îles Netagamiou, and probably throughout. Seven Islands: C. B. Robinson, No. 674 (H). Mingan seigniory: Mingan river, sand flat in, C. No. 90,416. Boishébert: rocky shore, baie des Moutons, C. No. 90,419.

Arenaria lateriflora L., var. *typica* (Regel) St. John. Dry thickets and borders of woods, throughout. Also collected by Storer, C. W. Townsend, D. N. Saint-Cyr, and Fernald and Wiegand.

A. lateriflora, var. *angustifolia* (Regel) St. John. Seven Islands: C. B. Robinson, No. 663 (H).

A. peploides L. Sea strand, occasional. Archipel de St. Augustin: Bayfield island, sea strand, C. No. 90,423. Brest: Blanc-Sablon, sandy sea strand, M. L. Fernald and K. M. Wiegand, No. 3,349. Southern Labrador: Storer (H). Various published records probably belong with var. *diffusa* which is much commoner.

A. peploides, var. *diffusa* Hornem. Sandy or rocky beaches, frequent throughout. Archipel du Vieux-Fort: île Herbée, sea strand, C. No. 90,425. Also collected by D. N. Saint-Cyr, C. B. Robinson, and Fernald and Wiegand.

A. peploides, var. *robusta* Fernald. Sandy or gravelly sea strand, common. Seven Islands: C. B. Robinson, No. 792 (H). Brest: Blanc-Sablon, sandy sea strand, M. L. Fernald and K. M. Wiegand, No. 3,348 (H).

[*A. SERPYLLIFOLIA* L.] Recorded by L. O. Brunet, and D. N. Saint-Cyr. They may have been dealing with *A. litorea*.

[*A. verna* L.] is erroneously recorded by Macoun (M) as collected by S. R. Butler on Caribou island. Butler himself (B⁵) and W. A. Stearns (S¹) list this species, but indicate that it comes from Amour.

A. litorea Fernald. Rocky and turfy shores, general. Mingan islands: île du Havre, D. N. Saint-Cyr (Q); Eskimo island, limestone sea-cliffs, C. No. 90,428; île Ste. Geneviève, limestone boulder, C. No. 90,427.

[*A. Michauxii* Hook.] of D. N. Saint-Cyr is *A. litorea*.

[*A. stricta* Michx.] Recorded by D. N. Saint-Cyr. Specimen not seen, but is probably *A. litorea*.

[*A. arctica* Steven.] Recorded by D. N. Saint-Cyr from Mingan river. This species is known from only three stations in eastern North America, all of them on serpentine rock. The plant is probably *Sagina nodosa* which is very abundant on the flats of Mingan river.

A. grænlantica Spreng. Exposed crests in the Laurentian area, from Ouapitagone east to the strait of Belle Isle. There is a doubtful record of D. N. Saint-Cyr from Mingan river. Ile Ouapitagone: rocky crest, C. No. 90,429. Ile Petit Mécatina: rocky summits, C. No. 90,430.

[*Mæhringia lateriflora* Fenzl.] *Arenaria lateriflora*, var. *typica*.

[*Honckenya peploides* Ehrh.] *Arenaria peploides* or a variety of it.

Stellaria borealis Bigel. Occasional. Archipel Ouapitagone: Romaine, wet cleft in rocks on island, C. No. 90,431. Most of the published records probably belong with one of the varieties, which are much commoner.

S. borealis, var. *isophylla* Fernald. Wet places, and borders of damp woods, common throughout. Lagorgendière: Romaine river, wet woods by, C. No. 90,432. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, Nos. 2 and 3 (H).

S. borealis, var. *floribunda* Fernald. Pointe au Maurier, occasional as far east as, damp grassy places. Seven Islands: C. B. Robinson, No. 664 (called *Alsine longifolia* (Muhl.) Britton) (H). Natashkwan: edge of thicket, C. No. 90,433. Charnay: pointe au Maurier, grassy shore, C. No. 90,434.

S. crassifolia Ehrh. Brackish or springy places, common throughout. Archipel Ouapitagone: Romaine, edge of a brackish pool, C. No. 90,435. Also collected by D. N. Saint-Cyr, J. A. Allen, and Fernald and Wiegand.

S. humifusa Rottb. Brackish shores, throughout. Archipel Ouapitagone: Romaine, salt marsh, C. No. 90,440. Also collected by D. N. Saint-Cyr, J. A. Allen, C. B. Robinson, and Fernald and Wiegand.

S. longipes Goldie. Open places near the shore, very common. Various collections made by others and by the author are treated as this species. They have various types of foilage, but all have similar inflorescences and flowers. This species is an aggregate that has yet to be resolved.

[*S. longipes*, var. *minor* Hook.] of D. N. Saint-Cyr is *S. longipes*.

[*S. Edwardsii* R. Br.] *S. longipes*.

[*S. longifolia* Muhl.] Recorded by D. N. Saint-Cyr from Watshishu. Specimen not seen, but is probably *S. longipes*.

[*S. GRAMINEA* L.] Recorded from Mingan islands: July, 1884, île Ste. Geneviève, D. N. Saint-Cyr. There is a cover labelled *S. graminea*, Mingan islands, July, 1882. Within is a sheet of *S. glauca* With., under which is a loose ticket saying "No. 106a, île d'Orleans, June 29, 1882." Prof. M. L. Fernald says: "*S. glauca* abounds in the neighbourhood of Quebec." In view of the evidence cited above it seems clear that the plant in question came from île d'Orleans and not from the region considered here.

S. MEDIA (L.) Cyrill. Introduced at numerous places. Mingan seigniory: Pointe-aux-Esquimaux, C. B. Robinson, No. 646 (H).

[*Cerastium arvense* L.] Probably one of the following species.

C. Beeringianum C. and S. Turfy and rocky shores, abundant. Mingan seigniory: Pointe-aux-Esquimaux, limestone headland, C. No. 90,818. Archipel Washicoutai: île Triple, turfy ledges, C. No. 90,819.

C. Fischerianum Seringe. Known only from Brest: Blanc-Sablon, abundant in damp runs and on mossy banks, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,389.

[*C. Alpinum* L.] Reported by D. N. Saint-Cyr from Mingan station.

C. VULGATUM L., var. *hirsutum* Fries. Introduced. Mingan harbour: D. N. Saint-Cyr (Q).

Lychnis alpina L. Brest: rivière à la Truite, south facing cliff of gneiss, C. No. 90,446.

SILENE LATIFOLIA (Mill.) Britt. and Rendl. Reported from rivière au Tonnerre: D. N. Saint-Cyr (called *S. inflata* Sm.) Specimen not seen.

[*S. INFLATA* Sm.] *S. latifolia*.

S. acaulis L., var. *exscapa* (All.) DC. Exposed ledges and hilltops in the Laurentian area, from île Tête à la Baleine east to the strait of Belle Isle. Southern Labrador: Storer (H). Ile Gros Mécatina: D. N. Saint-Cyr (Q). Archipel de St. Augustin: Anse portage, Cumberland island, rocky summit, C. No. 90,448.

PORTULACACEÆ (PURSLANE FAMILY)

Montia lamprosperma Cham. Rocky shores, throughout. Archipel du Petit-Mécatina: îles Netagamious, wet rocks, C. No. 90,450. Brest: Blanc-Sablon, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,042 (H).

Claytonia caroliniana Michx. Seven Islands: Manowin island, D. N. Saint-Cyr (Q).

NYMPHÆACEÆ (WATER LILY FAMILY)

Nymphozanthus variegatus (Engelm.) Fernald. Shallow ponds, common. Natashkwan: slough in sand dunes, C. No. 90,465.

RANUNCULACEÆ (CROWFOOT FAMILY)

Ranunculus aquatilis L., var. *capillaceus* DC. Brest: Brador, in a quiet brook, M. L. Fernald and K. M. Wiegand, No. 3,407 (H); anse des Dunes, shallow pond, C. No. 90,453.

R. Cymbalaria Pursh. Brackish shores, throughout. Seven Islands: C. B. Robinson, No. 719 (H). Mingan islands: Verrill, Hyatt, and Shaler (Y). Archipel de Kécarpoui: îles Affligées, edge of pool, C. No. 90,455.

R. Cymbalaria, f. *hebecaulis* Fernald. Ile à la Chasse; and Mingan seigniory: Betchouane, rocky limestone shore, C. No. 90,458.

R. hyperboreus Rottb. Moist hollows on outer islands and exposed headlands from Romaine to the strait of Belle Isle. Archipel Ouapitagon: Romaine, growing in wet moss on island, C. No. 90,459. Iles Affligées; île Kécarpoui; îles Netagamou. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 47 (H). Brest: Longue pointe.

[*R. Flammula* L., var. *reptans* (L.) Mey.] Reported from Mingan river, D. N. Saint-Cyr. Specimen not seen.

R. reptans L. Sandy borders of ponds, occasional. Natashkwan. Brest: Jones point, sandy pond shore, C. No. 90,461; sandy margins of small ponds, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,414 (H).

R. reptans, var. *ovalis* (Bigel.) T. and G. Archipel du Blanc-Sablon: Greenly island, J. A. Allen (called *R. Flammula* L., var. *reptans* Mey.) (Hb. Conn. Agric. Exp. Sta., New Haven).

R. abortivus L. Calcareous region of Mingan islands and the strait of Belle Isle. Mingan seigniory: Pointe-aux-Esquimaux, alder thicket, C. W. Townsend (H) and C. No. 90,462. Brest: Blanc-Sablon, damp limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,417 (H).

R. pennsylvanicus L. Mingan islands: D. N. Saint-Cyr (Q). Boishébert: Tabatière, meadow, C. No. 90,454. The latter collection has the leaves bluntly, instead of sharply, cut, the upper ones broader, and the stems much less hispid than in typical *R. pennsylvanicus*. It seems, however, to be a state due to an unusual amount of shade.

R. REPENS L. Introduced, observed at Mingan seigniory: Pointe-aux-Esquimaux.

R. ACRIS L. Introduced at numerous settlements. Brest: Blanc-Sablon, dooryard, C. No. 90,463.

R. ACRIS, var. *STEVENI* (Andrz.) Lange. Introduced. Pointe-aux-Esquimaux; Natashkwan: grassy shore, C. No. 90,464.

[*Thalictrum alpinum* L.] Reported from Mingan islands: St. Charles island, D. N. Saint-Cyr. Specimen not seen, but the plant is common on Anticosti.

T. confine Fernald. Calcareous region of Mingan islands. Mingan seigniory: Mingan, C. W. Townsend (H). Mingan islands: Eskimo island, top of limestone shingle, C. No. 90,466.

[*T. dioicum* L.] of D. N. Saint-Cyr and probably of all published records is *T. polygamum*.

T. polygamum Muhl. Wet or rocky shores, frequent throughout. Charnay: rivière Etamamiou, grassy shore, C. No. 90,468. Also collected by D. N. Saint-Cyr, C. W. Townsend, J. A. Allen, C. B. Robinson, and Fernald and Wiegand.

[*Thalictrum labradoricum* Greene] Ottawa Nat., xxiv, 53-4 (1910). Based on W. A. (erroneously written W. E.) Stearns, from Labrador, 1875 (U No. 257,767); and A. P. Low, thickets along the upper west branch of Hamilton river, Que., July 7, 1894. (C. No. 4,335). An examination of the former specimen and a study of the description give no evidence of diagnostic characters. The plant is interpreted as *T. polygamum*, var. *hebecarpum*.

[*T. Cornuti* L.] *T. polygamum*.

[*Anemone parviflora* Michx.] Reported (B²) from Natashkwan: "Sur les rochers, 1864, Commandant Fortin." Fortin also collected on Anticosti island, where this species is common, and it is probable that the plant came from Anticosti rather than from Natashkwan, a region of sand-plain and gneissic rocks.

Anemone canadensis L. Reported from Mingan islands: July 23, 1882, Eskimo island, D. N. Saint-Cyr (published as *A. pennsylvanica*). Specimen not seen.

[*A. pennsylvanica* L.] of D. N. Saint-Cyr would be *A. canadensis*.

Caltha palustris L. Wet, open places, region of Mingan islands and strait of Belle Isle. Mingan seigniory: Mingan, and Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: D. N. Saint-Cyr (Q); Verrill, Hyatt, and Shaler (Y); île du Havre, île à la Chasse, and île Ste. Geneviève. Brest: Longue pointe, grassy brookside, C. No. 90,469; Blanc-Sablon, abundant by streams, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,444 (H).

Coptis trifolia (L.) Salisb. Wet thickets and woods, very abundant throughout. Mingan islands: D. N. Saint-Cyr (Q). Archipel de St. Augustin: Bayfield island, mossy, shaded brookside, C. No. 90,470.

Actæa rubra Willd. Rich woods, common in the calcareous region of Mingan islands and the strait of Belle Isle, occasional throughout. Bois-hébert: baie des Moutons, grassy hillside, C. No. 90,472. Archipel de St. Augustin: Bayfield island, grass covered dunes, C. No. 90,471.

A. rubra, f. *neglecta* (Gillm.) Robinson. Growing with the preceding. Observed only in the calcareous region of Mingan islands: île Ste. Geneviève, mossy woods, C. No. 90,474.

FUMARIACEÆ (FUMITORY FAMILY)

Corydalis sempervirens (L.) Pers. Mingan river: at a point west of the river, D. N. Saint-Cyr (called *C. glauca*) (Q).

[*C. glauca* Pursh.] *C. sempervirens*.

CRUCIFERÆ (MUSTARD FAMILY)

Draba. Published records based on specimens that have not been seen are not included, as their disposition is too uncertain to be done satisfactorily.

D. nivalis Lilj. Labrador: Dr. Bryant (H). J. A. Allen and others have collected this species in eastern Labrador, and it is possible that this specimen came from there too. Dr. Bryant, however, did not go east of Château bay, so the chances are great that he found this plant somewhere on the south shore of the peninsula.

D. megasperma Fernald and Knowlton. Mingan islands: Eskimo island, limestone sea-cliffs, C. No. 90,476; île Ste. Geneviève, top of limestone shingle, C. No. 90,475. Otherwise known only from Gaspe peninsula.

D. incana L. Turfy headlands, occasional. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Ile Kécarpoui: grassy gully, C. No. 90,477. Recorded by D. N. Saint-Cyr from Watshishu. His plant is the var. *confusa*.

D. incana, var. *confusa* (Ehrh.) Poir. Turfy headlands and hillsides near the sea, common. Mingan seigniory: Watshishu, D. N. Saint-Cyr (called *D. incana*) (Q). Natashkwan river: C. W. Townsend (H). Île Kécarpoui: turfy hillside, C. No. 90,480.

D. aurea Vahl. Mingan islands: Chas. Lindon (H).

D. arabisans Michx. Mingan islands: D. N. Saint-Cyr (called *D. ramosissima* Desv.) (Q); Eskimo island, limestone sea-cliffs, C. No. 90,483. The plant so-called by D. N. Saint-Cyr is the var. *orthocarpa*.

D. arabisans, var. *orthocarpa* Fernald and Knowlton. Mingan islands: D. N. Saint-Cyr (called *D. arabisans*) (Q). Mingan seigniory: Pointe-aux-Esquimaux, rocky limestone headland, C. No. 90,485. Archipel Ouapi-tagone: Romaine, rocky crests, C. No. 90,484.

[*D. ramosissima* Desv.] of D. N. Saint-Cyr is *D. arabisans*.

[*D. alpina* L.] recorded from Watshishu, D. N. Saint-Cyr. Specimen not seen.

[*D. alpina* L., var. δ Hook.] recorded from Labrador, L. O. Brunet (B²).

[*D. alpina* L., var. *contorta* Ehrh.] recorded from Labrador, L. O. Brunet (B²).

[*D. alpina* L., var. γ *borealis* T. and G.] recorded from Labrador, anse des Dunes, L. O. Brunet (B²).

[*D. glabriuscula* L.] recorded from Mingan islands: D. N. Saint-Cyr. Specimen not seen.

THLASPI ARVENSE L. Introduced at several settlements. Seven Islands: C. B. Robinson, No. 842 (H). Mingan seigniory: Sheldrake river, D. N. Saint-Cyr (Q). Coacoachou; St. Augustin; and Chevalier: St. Paul, dooryard, C. No. 90,486.

LEPIDIUM SATIVUM L. Introduced. Mingan seigniory: Pointe-aux-Esquimaux, cultivated field, C. No. 90,487.

Subularia aquatica L. Etamamiou; and Brest: rivière Blanc-Sablon, shallow, sandy-bottomed pond, M. L. Fernald and K. M. Wiegand, No. 3,472 (H); rivière Blanc-Sablon, edge of slough from, C. No. 90,488.

CAPSELLA BURSA-PASTORIS (L.) Medic. Introduced, at most of the settlements. Pontchartrain: Vieux-Fort, path, C. No. 90,489.

Cakile edentula (Bigel.) Hook. Rivière Netagamiou, as far east as, sandy beaches, infrequent. Seven Islands: C. B. Robinson, No. 666 (H). Mingan islands: île du Havre, D. N. Saint-Cyr (called *C. americana*) (Q). Natashkwan river: C. W. Townsend (H). St. Vincent: rivière Netagamiou, sand beach, C. No. 90,490.

[*C. americana* Nutt.] *C. edentula*.

BRASSICA ARVENSIS (L.) Ktze. Introduced. Mingan, Mingan seigniory: Pointe-aux-Esquimaux, cultivated field, C. No. 90,491.

Erysimum asperum DC. Known from Mingan islands: Chas. Lindon (H); Verrill, Hyatt, and Shaler (called *E. lanceolatum*) (Y).

[*E. lanceolatum* R. Br.] of Verrill is *E. asperum*.

Cochlearia. No attempt has been made to correlate the published records of this genus in cases where the specimens have not been seen.

C. cyclocarpa S. F. Blake. Maritime rocks and shores, especially on the outer islands and exposed headlands, common. Mingan islands: île Niapisca, Verrill, Hyatt, and Shaler (called *C. tridactylites*) (Y). Archipel Washicoutai: île Triple, ledges, just above the reach of the sea, C. No.

90,834. Archipel du Blanc-Sablon: île Perroquets, crevices of maritime rocks, enriched by the dung of sea-birds, J. A. Allen, No. 57 (called *C. anglica*). Brest: Blanc-Sablon, wet limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,470 (called *C. officinalis*) (H).

[*C. officinalis* L.] Recorded by L. O. Brunet (B²) from Labrador: Fournier. It probably is *C. cyclocarpa*.

C. tridactylites Banks. Maritime rocks, occasional, throughout. Southern Labrador: Storer (H). Mingan islands: Eskimo island, C. W. Townsend (H). Archipel du Vieux-Fort: Bonne-Espérance, crevices of maritime rocks, enriched by the refuse of the fishery, J. A. Allen (called *C. anglica*) (H). Recorded by Verrill (V¹). The plant is *C. cyclocarpa*.

Radicula palustris (L.) Moench. Mingan seigniory: Watshishu, D. N. Saint-Cyr (called *Nasturtium palustre*) (Q).

R. palustris var. *hispida* (Desv.) Robinson. Lagorgendière: Romaine, grassy shore, C. No. 90,493. Archipel de St. Augustin: Bayfield island, grassy shore, C. No. 90,492.

[*Nasturtium palustre* DC.] *Radicula palustris*.

Barbarea orthoceras Ledeb. Meadows and grassy brooksides, from Romaine east to the strait of Belle Isle, occasional. Boishébert: Tabatière, meadow, C. No. 90,495. Brest: Jones point, grassy brookside, C. No. 90,494; Brador, abundant, along streams and rills, M. L. Fernald and K. M. Wiegand, No. 3,485 (H); abundant by brooks and by springy places, limestone and calcareous sandstone terraces, Blanc-Sablon, M. L. Fernald and K. M. Wiegand, No. 3,484 (H).

[*Cardamine pratensis* L.] Reported (B²) from Natashkwan: Fournier. It is probably the following var. *palustris*.

C. pratensis L., var. *palustris* Wimm. and Grab. Brest: Jones point, brookside, C. No. 90,496 (H).

C. pennsylvanica Muhl. Brest: Blanc-Sablon, by brooks and rivulets, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,487 (H).

Arabis alpina L. Strait of Belle Isle, region of the sedimentary rocks. Archipel du Blanc-Sablon: Greenly island, J. A. Allen (H). Brest: pointe à Peau, grassy brookside, C. No. 90,497; Blanc-Sablon, very abundant in wet places, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,491 (H).

A. Drummondi Gray. Mingan islands: July 4-5, 1861, Verrill, Hyatt, and Shaler (Y). It also occurs at the strait of Belle Isle in Newfoundland and Labrador.

SARRACENIACEÆ (PITCHER-PLANT FAMILY)

Sarracenia purpurea L. Bogs and tundra, common throughout. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Lagorgendière: Romaine, tundra, C. No. 90,498.

DROSERACEÆ (SUNDEW FAMILY)

Drosera rotundifolia L. Bogs and pond shores, abundant throughout. Brouague: boggy pond margin, C. No. 90,499. Also collected by C. W. Townsend and D. N. Saint-Cyr.

[*D. intermedia* Hayne] of D. N. Saint-Cyr is *D. rotundifolia*.

D. anglica Huds. Sphagnum bogs, occasional as far east as île Tête à la Baleine. Natashkwan: sphagnum bog, C. No. 90,502. Ile Ouapitagone: edge of pool in tundra, C. No. 90,500. Archipel du Gros-Mécatina: île Tête à la Baleine, sphagnum bog, C. No. 90,501.

D. longifolia L. Natashkwan: sphagnum bog, C. No. 90,503.

CRASSULACEÆ (ORPINE FAMILY)

Sedum villosum L. Archipel de Kécarpoui: îles Affligées, and île Kécarpoui, turfy hilltop, C. No. 90,505. This seems to be the first collection of this species in North America south of Greenland.

S. roseum (L.) Scop. Saline shores, throughout, especially abundant and luxuriant in the calcareous region of Mingan islands. Mingan seignior: Mingan, C. W. Townsend (H); Pointe-aux-Esquimaux, rocky limestone headland, C. No. 90,504.

[*S. Rhodiola* DC.] *S. roseum*.

SAXIFRAGACEÆ (SAXIFRAGE FAMILY)

[*Saxifraga nivalis* L.] Erroneously reported by Macoun (M) as collected on Caribou island by S. R. Butler. Neither Butler (B⁵) nor W. A. Stearns (S¹) lists the species.

Saxifraga aizoides L. Known within our area only from Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,518 (H). Recorded from Mingan islands: île Ste. Geneviève, D. N. Saint-Cyr. The plant so labelled is *S. oppositifolia*. In (Y) there is an unmounted specimen labelled Mingan islands, collected by Verrill, Hyatt, and Shaler. This record is not included in their published list (V¹) and the plants in question are so exactly similar that they would seem to be a part of the collection from Anticosti.

S. cæspitosa L. (*S. grænlantica* L.) Turfy hilltops and hillsides, outer islands and exposed headlands; occasional throughout. Ile Kécarpoui: turfy hilltops, C. No. 90,507. Also collected by Verrill, Hyatt, and Shaler; Dr. Bryant; C. W. Townsend; D. N. Saint-Cyr; and Fernald and Wiegand. In Dr. Wm. Kelly's manuscript list.

[*S. grænlantica* L.] *S. cæspitosa*.

S. Aizoon Jacq. Abundant on the calcareous ledges of Mingan islands, and on syenite at baie des Moutons. Mingan islands: D. N. Saint-Cyr; Verrill, Hyatt, and Shaler; île Ste. Geneviève, top of limestone shingle, C. No. 90,508. Boishébert: baie des Moutons, on disintegrating perthitic syenite ledge, C. No. 90,509. In Dr. Wm. Kelly's manuscript list.

S. oppositifolia L. Wet calcareous cliffs of Mingan islands; also at Forteau bay, on the Labrador side of the strait of Belle Isle. Mingan islands: Eskimo island, C. W. Townsend (H); Eskimo island, wet limestone cliffs, C. No. 90,510; D. N. Saint-Cyr (Q).

Mitella nuda L. Mossy woods. Common in calcareous region of Mingan islands and the strait of Belle Isle, known in the Laurentian area only at Natashkwan. Mingan islands: île Ste. Geneviève, D. N. Saint-Cyr (Q). Brest: rivière Blanc-Sablon, thicket by, C. No. 90,511.

Parnassia parviflora DC. Abundant on limy ledges and shores, region of Mingan islands: île du Havre, D. N. Saint-Cyr (Q); Eskimo island, St. Charles island, and île à la Chasse. Mingan seigniory: Betchouane, rocky limestone shore, C. No. 90,513.

P. palustris L. Southern Labrador: Storer (H).

P. Kotzebuei C. and S. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,536 (H).

Ribes hirtellum Michx. Thickets and borders of woods, throughout. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Goy-nish: îles Boiséées de Cap Blanc, Washtawouka, edge of woods, C. No. 90,514. Charnay: pointe au Maurier, border of salt marsh, C. No. 90,513. Brest: Blanc-Sablon, by a brook, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,538 (H). Recorded by Verrill. The plant is the var. *calcicola*.

R. hirtellum, var. *calcicola* Fernald. Mingan islands: Verrill, Hyatt, and Shaler (called *R. hirtellum*) (Y); Eskimo island, top of limestone shingle, C. No. 90,516.

[*R. americanum* Mill.] A sheet of this is contained in the cover of *R. lacustre* from Watshishu or Mingan islands, D. N. Saint-Cyr. It is without data, and will not be credited here.

R. lacustre Poir. Rich woods on Mingan islands: Verrill, Hyatt, and Shaler (Y); Eskimo island, mossy woods, C. No. 90,517. D. N. Saint-Cyr records this from Mingan islands, but his collection is labelled as coming from Watshishu. S. R. Butler records (B⁵) this species, "ravines, common in the interior." In Dr. Wm. Kelly's manuscript list.

R. prostratum L'Hér. Thickets and borders of woods, very common throughout. St. Vincent: rivière Netagamou, edge of woods, C. No. 90,520. Also collected by C. W. Townsend, Storer, D. N. Saint-Cyr, and Fernald and Wiegand. Recorded by S. R. Butler (B⁵).

R. triste Pall. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H); Mingan islands: Eskimo island, mossy woods, C. No. 90,521. Recorded by Fernald, Rhodora, xiii, 125 (1911), but the specimen is of the var. *albinervium* as it is labelled.

R. triste, var. *albinervium* (Michx.) Fernald. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,544 (H).

ROSACEÆ (ROSE FAMILY)

Spiræa latifolia Borkh. Seven Islands: C. B. Robinson, No. 683 (H).

S. latifolia, var. *septentrionalis* Fernald. Natashkwan: sand dunes, C. Nos. 90,522 and 90,523.

Pyrus arbutifolia (L.) L. f., var. *atropurpurea* (Britton) Robinson. Tundra, occasional as far east as Romaine. Mingan; Piashti bay; and Lagorgendière: Romaine, tundra, C. No. 90,524.

P. americana (Marsh.) DC. Very common in wooded hillsides and valleys. Lagorgendière: Romaine, wooded riverside, C. No. 90,525. Eskimo river: J. A. Allen; No. 12 (H). Reported by W. A. Stearns (S¹), S. R. Butler (B⁵), and R. Bell (B⁴).

[*P. americana* DC., var. *microcarpa*.] Reported by W. A. Stearns (S¹), "not rare." This is probably *P. americana*.

[*P. sambucifolia*.] Indicated by R. Bell (B⁴) as growing all over the southern part of the peninsula. This should probably be interpreted as *P. americana*.

Amelanchier Bartramiana (Tausch) Roemer. Thickets and borders of woods, very abundant throughout. Mingan seigniory: Eskimo island, shrub 3 feet high, mossy woods, C. No. 90,529. Also collected by C. W. Townsend, and C. B. Robinson. Reported by S. R. Butler (B⁵).

[*A. canadensis* T. and G.] of D. N. Saint-Cyr is in part *A. lævis* and in part *A. stolonifera*. Reported by J. B. A. Ferland (F¹), and A. S. Packard (P), it is probably *A. Bartramiana*.

[*A. canadensis* T. and G., var. *oligocarpa* Gray.] *A. Bartramiana*.

[*A. stolonifera* Wiegand.] There is a good flowering spray mounted on a sheet with *A. lævis* (Q) collected by D. N. Saint-Cyr at Mingan, Watshishu, or Gros Mécatina.

[*A. lævis* Wiegand.] A sheet collected by D. N. Saint-Cyr containing *A. lævis* and *A. stolonifera* (called *A. canadensis*). It is recorded as coming from Watshishu, June, 1882, and Gros Mécatina, July 12, 1885, but the cover is labelled Mingan, June, 1882. There is too much confusion here to allow this to be accepted as the sole record for the region.

Fragaria virginiana Duchesne. Dry, grassy slopes, occasional as far east as Watshishu. Mingan islands: Eskimo island, grassy clearing, C. No. 90,532. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend, (H); Watshishu, D. N. Saint-Cyr (called *F. vesca*).

F. virginiana, var. *terræ-novæ* (Rydb.) Fernald and Wiegand. Occasional, throughout. Seven Islands: D. N. Saint-Cyr (called *F. virginiana*) (Q). Natashkwan: dune hollow, C. No. 90,531. Brest: Blanc-Sablon, M. L. Fernald and K. M. Wiegand, Nos. 3,559 and 3,563.

[*F. vesca* L.] of D. N. Saint-Cyr is *F. virginiana*.

Potentilla monspeliensis L. Grassy shores and banks, throughout. Mingan islands: île du Havre, D. N. Saint-Cyr (called *P. norvegica*) (Q). Archipel Washicoutai: île Triple, grassy bank, C. No. 90,533. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces and along brooks, M. L. Fernald and K. M. Wiegand, No. 3,567 (H).

P. monspeliensis var. *norvegica* (L.) Rydb. Grassy shores and banks, throughout. Archipel du Vieux-Fort: île Herbée, grassy top of strand, C. No. 90,535.

[*P. norvegica* L.] of D. N. Saint-Cyr is *P. monspeliensis*. Record of S. R. Butler (B⁵) probably belongs with *P. monspeliensis* var. *norvegica*.

P. pectinata Raf. Dry, open spots, calcareous region of Mingan islands. Mingan seigniory: near Hudson's Bay Co.'s post, D. N. Saint-Cyr (called *P. pennsylvanica*) (Q); Mingan, grassy shore, C. No. 90,536; Pointe-aux-Esquimaux, rocky limestone headland, C. No. 90,537. In Dr. Wm. Kelly's manuscript list (called *P. strigosa*).

[*P. pennsylvanica* L.] of D. N. Saint-Cyr is *P. pectinata*.

P. palustris (L.) Scop. Bogs, borders of ponds, wet meadows, and shores, throughout. Natashkwan: Little Natashkwan river, brackish bog at mouth of, C. W. Townsend (H). Boishébert: rocky shore, Tabatière, C. No. 90,538.

P. palustris, f. *subsericea* (Becker) Wolf. Archipel du Vieux-Fort: île Herbée, top of strand, C. No. 90,540.

P. palustris, var. *parvifolia* (Raf.) Fernald and Long. Wet shores, from Romaine east to the strait of Belle Isle, occasional. Archipel de Kécarpoui: île du Petit Rigolet, marshy shore, C. No. 90,541.

P. fruticosa L. Thickets and borders of woods in the calcareous region of Mingan islands and strait of Belle Isle. Mingan seigniory: Pointe-aux-Esquimaux, rocky limestone headland, C. No. 90,543. Eskimo island, and île Ste. Geneviève. Brest: Longue pointe, grassy brookside, C. No. 90,542; Blanc-Sablon, in damp places, M. L. Fernald and K. M. Wiegand, No. 3,573 (H).

P. tridentata Ait. Rocky and exposed situations, common throughout. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Ile Ouapitagone: rocky crests, C. No. 90,544. Brest: Blanc-Sablon, in sand on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,584 (H).

P. Anserina L. Rocky or marshy saline shores, or beaches, abundant throughout. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Archipel Ouapitagone: Romaine, strand, C. No. 90,545.

P. Anserina, var. *sericea* Hayne. Sandy strands, infrequent. Pointe-aux-Esquimaux; and archipel du Vieux-Fort: île Herbée, sand beach, C. No. 90,546.

P. pacifica Howell. Brackish shores, occasional. Seven Islands: C. B. Robinson, No. 689 (called *Argentina Anserina*) (H). Mingan seigniory: Mingan, C. W. Townsend (H). Brest: Blanc-Sablon, brackish shore, M. L. Fernald and K. M. Wiegand, No. 3,587 (H).

[*Sibbaldiopsis tridentata* (Soland.) Rydb.] *Potentilla tridentata*.

Geum macrophyllum Willd. Wet thickets and meadows, in the calcareous region of Mingan islands and the strait of Belle Isle. Mingan seigniory: Pointe-aux-Esquimaux, alder thicket, C. No. 90,548. Betchouane; île du Havre; île Ste. Geneviève. Brest: Jones point, grassy brookside, C. No. 90,549; Blanc-Sablon, abundant in damp thickets, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 3,592 (H).

G. rivale L. Mingan islands and the strait of Belle Isle, wet meadows and bogs. Mingan islands: D. N. Saint-Cyr (Q); Verrill, Hyatt, and Shaler: île à la Chasse, edge of thicket, C. No. 90,551. Brest: Jones point, swale near pond, C. No. 90,550.

Dryas integrifolia Vahl. Limestone cliffs and ledges of Mingan islands: Mingan island, Verrill, Hyatt, and Shaler (Y); Mingan island, D. N. Saint-Cyr (Q); Eskimo island, C. W. Townsend (H), and C. Nos. 90,547 and 90,552. St. Charles island, and île Ste. Geneviève. In Dr. Wm. Kelly's manuscript list.

D. N. Saint-Cyr reports this species from Gros Mécatina, July 12, 1885. Specimen not seen. The plant would not be expected on this island in the Laurentian area.

Rubus idæus L., var. *canadensis* Richardson. Widely distributed in thickets and borders of woods. Natashkwan river: C. W. Townsend (H). Lagorgendière; Romaine, edge of woods, C. No. 90,554. Legardeur: rivière Coacoachou, grassy shore, C. No. 90,553. Southern Labrador: Storer (H).

A specimen from Seven Islands: C. B. Robinson, No. 864, is cited by P. A. Rydberg in Bull. Torr. Bot. Club, xlii, 135 (1915) as *Rubus subarcticus* (Greene) Rydb. It is probably *R. idæus*, var. *canadensis*.

[*R. strigosus* Michx.] *R. idæus*, var. *canadensis*.

R. Chamæmorus L. Bogs and tundra, turfy hillsides, and even running into woods, very abundant, throughout. Archipel de Kécarpoui: île du Petit Rigolet, turfy hillside, C. No. 90,556. Also collected by Townsend, D. N. Saint-Cyr, and C. B. Robinson.

R. arcticus L. Grassy or turfy places, occasional throughout. Archipel du Vieux-Fort: île Herbée, grassy top of strand, C. No. 90,558. Brest: Blanc-Sablon, M. L. Fernald and K. M. Wiegand, Nos. 3,067 and 3,069 (H). Reported by D. N. Saint-Cyr, S. R. Butler, and L. O. Brunet. Collection of Verrill's is of the var. *grandiflorus*.

R. arcticus, var. *grandiflorus* Ledeb. Grassy or turfy places, throughout. Southern Labrador: Storer; Dr. Bryant. Mingan islands: Verrill, Hyatt, and Shaler (called *R. arcticus*) (Y). Mingan seigniory: Mingan; C. W. Townsend (H); Pointe-aux-Esquimaux, mossy bank, C. No. 90,559. Brest: Brador and Blanc-Sablon, M. L. Fernald and K. M. Wiegand, Nos. 3,612 and 3,609 (H).

R. pubescens Raf. Open places or borders of woods, occasional throughout. St. Vincent: rivière Netagamou, sand dunes at mouth of, C. No. 90,561. Also collected by C. W. Townsend, D. N. Saint-Cyr, and Fernald and Wiegand.

[*R. triflorus* Richards.] *R. pubescens*.

[*R. canadensis* L.] of D. N. Saint-Cyr is *R. pubescens*.

Dalibarda repens L. Mingan islands: île à la Chasse, July 21, 1882, D. N. Saint-Cyr (Q).

Alchemilla vulgaris L., var. *filiacaulis* (Buser) Fernald and Wiegand. Brest: anse des Dunes, grassy brookside, C. No. 90,564.

A. vulgaris, var. *vestita* (Buser) Fernald and Wiegand. Archipel du Blanc-Sablon: Greenly island, J. A. Allen (Hb. Conn. Agric. Exp. Sta., New Haven). This variety has also been collected east of rivière Blanc-Sablon by Fernald and Wiegand, and C. W. Townsend.

Sanguisorba canadensis L. Bogs and wet thickets, general. Southern Labrador: Storer (H).

S. canadensis, var. *latifolia* Hook. (*S. sitchensis* C. A. Mey.) Bogs and wet thickets, very common, throughout. This variety with shorter, broader, ovate-cordate leaves, and a shorter spike is much commoner than the species. Pontchartrain: Vieux-Fort, grassy shore, C. No. 90,565.

Prunus pennsylvanica L.f. Mingan seigniory: Mingan, C. W. Townsend (H), and wooded bank 3 miles up Mingan river, C. No. 90,566; Watshishu, D. N. Saint-Cyr (Q). R. Bell indicates (B⁴) that this species is general in the southern part of the peninsula. There seems to be no evidence, however, that it grows in the coastal regions east of Watshishu. Macoun (M) erroneously reports this from Caribou island as collected by S. R. Butler. Neither Butler (B⁵) nor Stearns (S¹) lists the tree at all.

LEGUMINOSÆ (PULSE FAMILY)

TRIFOLIUM PRATENSE L. Introduced. Mingan islands: île Ste. Geneviève, D. N. Saint-Cyr (Q). Mingan seigniory: Betchouane, grassy clearing, C. No. 90,567.

T. REPENS L. Introduced, common at many of the settlements. Brest: Blanc-Sablon, dooryard, C. No. 90,568.

T. HYBRIDUM L. Introduced. Mingan seigniory: Mingan, dooryard, C. No. 90,569.

T. PROCUMBENS L. Introduced. Mingan seigniory: rivière au Tonnerre, D. N. Saint-Cyr (Q).

[*Astragalus alpinus* L.] Erroneously recorded by Macoun (M) as collected at Caribou island by S. R. Butler. Butler himself (B⁵) and W. A. Stearns (S¹) record it only from Amour, which is outside of the area treated here.

VICIA CRACCA L. Introduced at several places, as far east as St. Augustin. Mingan islands: Grande île, D. N. Saint-Cyr (Q). St. Augustin river: Hudson's Bay Co. post, grassy bank near, C. No. 90,571. In Dr. Wm. Kelly's manuscript list.

Lathyrus maritimus (L.) Big. Saline shores, and turfy hillsides near the sea, abundant all along the coast. Seven Islands: C. B. Robinson, No. 777 (H). Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Mingan islands: île Ste. Geneviève, limestone shingle, C. No. 90,572.

[*L. maritimus*, var. *aleuticus* Greene.] Southern Labrador: Storer (H). This plant does not seem worthy of distinction even as a form. The plants seem to be merely young or dwarfed individuals of exposed habitats, and should be treated as *L. maritimus*.

[*L. palustris* L.] Reported by J. Richardson (R¹), and S. R. Butler (B⁵). The plants are probably of the var. *pilosus*.

L. palustris L., var. *pilosus* (Cham.) Ledeb. Boggy, usually saline shores, occasional. Seven Islands: C. B. Robinson, No. 913 (H). Mingan islands: St. Charles island, D. N. Saint-Cyr (Q). Natashkwan: Little Natashkwan river, mouth of, C. W. Townsend (H). Charnay: pointe au Maurier, brackish shore, C. Nos. 90,575 and 90,576. Brest: Blanc-Sablon, M. L. Fernald and K. M. Wiegand, No. 3,645 (H).

OXALIDACEÆ (WOOD SORREL FAMILY)

Oxalis montana Raf. (*O. Acetosella* L.) Deep mossy woods, occasional. Seven Islands: C. B. Robinson, No. 892 (H). Ile du Havre. Natashkwan river: C. W. Townsend (H). Lagorgendière: wet woods by Olomanoshibo river, C. No. 90,577. St. Augustin river.

O. CORNICULATA L. Introduced. Mingan seigniory: rivière au Tonnerre, D. N. Saint-Cyr (Q).

POLYGALACEÆ (MILKWORT FAMILY)

[*Polygala paucifolia* Willd.] Reported from Mingan seigniory: Watshishu, D. N. Saint-Cyr. Specimen not seen, but the record may be all right.

CALLITRICHACEÆ (WATER STARWORT FAMILY)

Callitriche palustris L. Shallow ponds, general. Archipel Ouapitagon: île du Havre, Romaine, filling a rock pool, C. No. 90,579. Charnay: rivière Etamamiou, muddy brook, C. No. 90,578.

C. anceps Fernald. Brest: rivière Blanc-Sablon, shallow, sandy-bottomed pools, M. L. Fernald and K. M. Wiegand, Nos. 3,648 and 3,649 (H).

C. autumnalis L. Brest: rivière Blanc-Sablon, shallow, sandy-bottomed pools, M. L. Fernald and K. M. Wiegand, No. 3,647 (H).

EMPETRACEÆ (CROWBERRY FAMILY)

Empetrum nigrum L. Hillsides, ledges, or even in bogs, very abundant and universally distributed. Southern Labrador: Storer (H). Mingan seigniory: Pointe-aux-Esquimaux, rocky headland, C. No. 90,580, and C. W. Townsend (H). Archipel de St. Augustin: île des Génévriers, rocky crest, C. No. 90,581. Reported by C. B. Robinson (R²), J. B. A. Ferland (F¹), and D. N. Saint-Cyr.

E. atropurpureum Fernald and Wiegand. Archipel de St. Augustin: île des Génévriers, rocky crest, C. No. 90,582.

E. Eamsii Fernald and Wiegand. Rocky or sandy hilltops from baie des Moutons east to the strait of Belle Isle. Baie des Moutons: Boishébert: Tabatière, J. B. A. Ferland (H). Brouague: Petite rivière Coxipi, rocky crest, C. No. 90,583. Vieux-Fort; St. Paul; and Brest: Blanc-Sablon, abundant on sand and rock, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,661 (H).

[*E. rubrum* Willd.] of J. B. A. Ferland (F¹) is *E. Eamsii*.

AQUIFOLIACEÆ (HOLLY FAMILY)

Nemopanthus mucronata (L.) Trel. Thickets, occasional, as far east as baie des Moutons. Seven Islands: C. B. Robinson, No. 783 (H). Mingan seigniory: Mingan, granite hills, C. No. 90,584. Natashkwan river: C. W. Townsend (H).

ACERACEÆ (MAPLE FAMILY)

Acer spicatum Lam. Seven Islands: C. B. Robinson, No. 898 (H). Mingan; and Mingan islands: Eskimo island, wooded bank, C. No. 90,587.

BALSAMINACEÆ (TOUCH-ME-NOT FAMILY)

Impatiens biflora Walt. Mingan islands: Eskimo island, wet thicket, C. No. 90,588.

RHAMNACEÆ (BUCKTHORN FAMILY)

Rhamnus alnifolia L'Hér. Rich woods, region of Mingan islands: île Ste. Geneviève, edge of woods, C. No. 90,589. Observed at Eskimo island; île à la Chasse; and Pointe-aux-Esquimaux.

GUTTIFERÆ (ST. JOHN'S-WORT FAMILY)

Hypericum boreale (Britton) Bicknell. Mingan seigniory: Mingan river, sand flat in, C. No. 90,590.

H. virginicum L. Seven Islands: C. B. Robinson (called *Triadenum virginicum* (L.) Raf.), (C and H).

[*Triadenum virginicum* (L.) Raf.] *Hypericum virginicum*.

CISTACEÆ (ROCKROSE FAMILY)

Hudsonia tomentosa Nutt., var. *intermedia* Peck. Seven Islands: C. B. Robinson, No. 836 (H).

VIOLACEÆ (VIOLET FAMILY)

[*Viola cucullata* Ait.] Natashkwan river: C. W. Townsend (H). Verified by E. Brainerd, but it is a young plant, badly smashed, and with two leaves only.

This species is recorded by J. Richardson (R¹), and D. N. Saint-Cyr. Specimens not seen.

Viola nephrophylla Greene. Wet woods in calcareous region of Mingan islands. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: île Ste. Geneviève, boggy thicket, C. No. 90,591.

V. Selkirkii Pursh. Brest: pointe à Peau, moist thicket, C. No. 90,592. D. N. Saint-Cyr records this species from Mingan harbour, June 26, 1882. The plant is all right, but a loose ticket under the plant says Bois Gomin, près Quebec, June 12, 1884. This record should be excluded.

V. palustris L. Southern Labrador: Dr. Bryant (H).

V. pallens (Banks) Brainerd. Meadows, bogs, and mossy woods, common throughout. Ile Ouapitagone: tundra, C. No. 90,594.

[*V. blanda* Willd.] Recorded by S. R. Butler (B⁵), L. O. Brunet (B²), and D. N. Saint-Cyr. These are probably to be interpreted as *V. pallens*.

V. incognita Brainerd. Mossy woods and wet thickets, common throughout. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Brouague: Petite rivière Coxipi, alder thicket, C. No. 90,598. Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, Nos. 3,696 and 3,697 (H). A collection from Brouague: Robin bay, wet mossy thicket, August 4, 1915, C. No. 90,596, is of mature plants with the leaves quite glabrate, and the capsules green.

[*V. renifolia* Gray.] Listed by M. L. Fernald, *Rhodora*, xiii, 125 (1911) as found at Blanc-Sablon. The specimen on which this is based is cited under the following var. *Brainerdii*.

V. renifolia Gray, var. *Brainerdii* (Greene) Fernald. Brest: abundant on upper dry crests, limestone and calcareous sandstone terraces, Blanc-Sablon, M. L. Fernald and K. M. Wiegand, No. 3,704 (H).

[*V. rotundifolia* Michx.] Recorded from Mingan: D. N. Saint-Cyr, May-June, 1882. There is a confusion of the data, and there are several plants within the cover (Q), so that this cannot be verified.

V. labradorica Schrank. Mingan seigniory: Mingan, and Pointe-aux-Esquimaux, C. W. Townsend (H). Brest: Blanc-Sablon, limestone and calcareous sandstone terraces, and gravelly thicket back of strand, M. L. Fernald and K. M. Wiegand, Nos. 3,707 and 3,708 (H). Various published records probably bring the species to stations between these extremes.

[*V. Muhlenbergii* Torrey.] Reported by S. R. Butler (B⁵), is probably *V. labradorica*.

[*V. canina* L., var. *sylvestris* Regel] reported by W. A. Stearns (S¹) is probably *V. labradorica*, and likewise a record by D. N. Saint-Cyr.

V. adunca J. E. Smith. Natashkwan: edge of woods on sand dunes, C. No. 90,599.

[*V. TRICOLOR* L.] Reported from Pointe-aux-Esquimaux, D. N. Saint-Cyr.

ELÆAGNACEÆ (OLEASTER FAMILY)

Shepherdia canadensis (L.) Nutt. Abundant in rich woods in the calcareous region of Mingan islands: Eskimo island, C. W. Townsend (H); île Ste. Geneviève, rocky bank, C. No. 90,600. Mingan seigniory: Pointe-aux-Esquimaux, rocky limestone headland, C. No. 90,601.

ONAGRACEÆ (EVENING PRIMROSE FAMILY)

Epilobium angustifolium L. Turfy hillsides and thickets, very abundant, throughout. Île Kécarpoui: turfy hillside, C. No. 90,602. Reported by J. Richardson (R¹), S. R. Butler (B⁵), and Verrill (V¹).

E. latifolium L. Mingan seigniory: river gravels, Mingan river, C. No. 90,604, and D. N. Saint-Cyr (Q). In Dr. Wm. Kelly's manuscript list.

[*E. molle* Torr.] Reported by W. A. Stearns (S¹), Bonne-Espérance, and the interior, very common. The identity of this is doubtful.

E. palustre L. Wet places, very abundant, throughout. Archipel de Kécarpoui: îles Affligées, moist hillside, C. No. 90,605. Also collected by Storer, C. B. Robinson, J. A. Allen, and Fernald and Wiegand.

E. palustre, var. *monticola* Haussk. Seven Islands: C. B. Robinson (C). Archipel de Kécarpoui: île du Petit Rigolet, grassy shore, C. No. 90,609. Archipel du Vieux-Fort: Bonne Espérance, J. A. Allen, Nos. 55 and 56 (called var. *lineare*) (H).

E. palustre, var. *longirameum* Fernald and Wiegand. Archipel du Petit-Mécatina: îles Netagamiou, grassy bank, C. No. 90,610. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 53 (H). Brest: Blanc-Sablon, on the gneiss plain, in wet places back of the strand, M. L. Fernald and K. M. Wiegand, Nos. 3,720 and 3,726 (H).

E. glandulosum Lehm. Seven Islands: C. B. Robinson, No. 865 (called *E. adenocaulon*) (H). Brest: Blanc-Sablon, sandy strand, M. L. Fernald and K. M. Wiegand, Nos. 3,737 and 3,738 (H).

E. alpinum L. (*E. Hornemanni* Reich.) Wet places, occasional from baie des Moutons east to the strait of Belle Isle. Archipel du Blanc-Sablon: Greenly island, J. A. Allen, No. 50 (called *E. origanifolium*) (H). Brest: Jones point, grassy brookside, C. No. 90,612. Reported from Labrador (B²).

E. alpinum, f. *lactiflorum* (Haussk.) A. H. Moore. Boishébert: baie des Moutons, wooded brookside, C. No. 90,613.

[*E. canescens* L.] Recorded by D. N. Saint-Cyr. Linnæus does not seem to have made any such species. Specimen not seen.

Circæa alpina L. Wet woods, occasional. Brouague: Petite rivière Coxipi, alder thicket by, C. No. 90,615.

HALORAGIDACEÆ (WATER MILFOIL FAMILY)

Myriophyllum exalbescens Fernald. Shallow ponds and streams, Mingan islands, and strait of Belle Isle. Mingan: île du Havre. Brest: Longue pointe, shallow pond, C. Nos. 90,616 and 90,617; rivière Blanc-Sablon, shallow, sandy-bottomed pools, M. L. Fernald and K. M. Wiegand, No. 3,753 (H).

Hippuris vulgaris L. Shallow pools and bogs, generally distributed. Lagorgendière: Romaine, shallow pool on isle, C. No. 90,618. Boishébert: Tabatière, J. B. A. Ferland (H). Brest: rivière Blanc-Sablon, shallow sandy-bottomed pools, M. L. Fernald and K. M. Wiegand, No. 3,757 (H).

H. vulgaris, var. *maritima* Hartm. Brackish marshes and river estuaries. Infrequent, but generally distributed. Mingan seigniory: Mingan, C. W. Townsend (H). Phelypeaux: baie du Milieu, J. A. Allen (H). Brest: rivière à la Truite, brackish pool, C. No. 90,619.

ARALIACEÆ (GINSENG FAMILY)

Aralia hispida Vent. Mingan seigniory: Mingan, sandy bank, C. No. 90,620. In Dr. Wm. Kelly's manuscript list.

A. nudicaulis L. Thickets and mossy woods, rather common as far east as île du Petit Rigolet. Mingan seigniory: Mingan, C. W. Townsend (H). Archipel de Kécarpoui: île du Petit Rigolet, wooded gully, C. No. 90,622.

UMBELLIFERÆ (PARSLEY FAMILY)

Cicuta bulbifera L. Mingan islands: île du Havre, swampy pond shore, C. No. 90,623.

Ligusticum scothicum L. Saline shores and turfy hillsides near the sea, very abundant, throughout. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Ile Kécarpoui: rocky shore, C. No. 90,626.

Cælopleurum lucidum (L.) Fernald. Turfy and rocky shores, common, all along the coast. Mingan seigniory: Mingan, C. W. Townsend (H). Natashkwan: C. W. Townsend (H). Boishébert: Tabatière, meadow, C. No. 90,626. Eskimo river: shore of river, J. A. Allen, No. 48 (H). Brest: Blanc-Sablon, sandy strand, everywhere, M. L. Fernald and K. M. Wiegand, No. 3,776 (H).

[*C. Gmelini*] so recorded by Wm. Palmer. It should be interpreted as *C. lucidum*.

Heracleum lanatum Michx. Meadows and wet thickets, common throughout. Mingan seigniory: Mingan, C. W. Townsend (H). Mingan islands: île Perroquets, D. N. Saint-Cyr (Q). Charnay: pointe au Maurier, swale, C. No. 90,627.

Conioselinum chinense (L.) BSP. Turfy hillsides, mossy woods or thickets, common throughout. Natashkwan river, C. W. Townsend (H). Brouague: Petite rivière Coxipi, rocky bank of, C. No. 90,628. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen, No. 60 (H).

[*Angelica atropurpurea* L.] Recorded by S. R. Butler (B⁵) and L. O. Brunet (B²). The plant occurs in the calcareous parts of Newfoundland and Anticosti, and may be here on the "côte nord."

CORNACEÆ (DOGWOOD FAMILY)

Cornus canadensis L. In open or wooded places, nearly universal. Archipel Ouapitagone: Romaine, edge of thicket, C. No. 90,630. Also collected by C. W. Townsend, C. B. Robinson, Storer, and D. N. Saint-Cyr. Reported by L. O. Brunet (B²) and S. R. Butler (B⁵).

C. suecica L. Turfy and rocky shores, or hillsides near the sea, all along the coast. Southern Labrador: Storer (H). Seven Islands: C. B. Robinson, No. 687 in part (H). Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Archipel du Gros-Mécatina: île Tête à la Baleine, turfey shore, C. No. 90,633. Brest: Blanc-Sablou, on rocks or in sand on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,793 (H).

C. stolonifera Michx. Thickets and borders of woods, common on Mingan islands and strait of Belle Isle; occasional in deep woods and river valleys throughout. Mingan islands: île Ste. Geneviève, edge of woods, C. No. 90,635, and D. N. Saint-Cyr (Q). Mingan seigniory: Mingan, C. W. Townsend (H). Brouague: Shekatika river, rocky bank of, C. No. 90,634.

ERICACEÆ (HEATH FAMILY)

Moneses uniflora (L.) Gray. Deep mossy woods, occasional throughout. Mingan seigniory: Mingan, C. W. Townsend (H). Mingan islands: île à la Chasse, D. N. Saint-Cyr (Q). Natashkwan river: C. W. Townsend (H). Lagorgendière: Romaine, mossy woods, C. No. 90,636.

Pyrola minor L. Mossy woods, common in the calcareous region of Mingan islands and strait of Belle Isle, also at one station in the Laurentian area, Brouague. Mingan seigniory: Mingan, C. W. Townsend (H), Mingan, and mossy woods, C. No. 90,638; Mingan islands: Verrill, Hyatt, and Shaler (Y). Brouague: Petite rivière Coxipi, mossy evergreen woods, C. No. 90,637.

[*P. secunda* L.] Recorded by D. N. Saint-Cyr from Eskimo island, July 27, 1882. The cover (in Q) is marked Mingan islands, July, 1882, and within are several plants, under one of which is a loose ticket saying, îles d'Orleans, July 17, 1883. There is too much confusion here to allow this record to be accepted.

P. secunda L., var. *obtusata* Turcz. Mossy woods in the calcareous region of Mingan islands and at one other station. Southern Labrador: Storer (H). Seven Islands: C. B. Robinson (C). Mingan islands: D. N. Saint-Cyr (Q); limestone sea-cliffs, C. No. 90,640; île Ste. Geneviève, top of limestone shingle, C. No. 90,639.

[*P. secunda* L. var. *pumila* Gray] of D. N. Saint-Cyr is the var. *obtusata*.

[*P. chlorantha* Sw.] Recorded from Mingan islands: île aux Calculeaux, D. N. Saint-Cyr (Q). The cover labelled îles Mingan, July, 1882, contains three sheets of this species, under each plant is a loose ticket, two reading île Ste. Geneviève, July 17, 1882, and one, île d'Orleans, July 3, 1883. There is confusion here, but the record seems likely.

P. asarifolia Michx. Mingan islands: D. N. Saint-Cyr (called *P. rotundifolia* var. *asarifolia*) (Q).

P. asarifolia, var. *incarnata* (Fisch.) Fernald. Mossy woods and ledges, common in the calcareous region of Mingan islands: Eskimo island, wet limestone sea-cliffs, C. No. 90,643; île à la Chasse, limestone ledge, C. No. 90,642; île Ste. Geneviève, limestone sea-cliffs, C. No. 90,641.

[*P. rotundifolia* L., var. *asarifolia* Hook.] of D. N. Saint-Cyr is *P. asarifolia*.

[*P. rotundifolia*, var. *uliginosa* Gray.] Record of D. N. Saint-Cyr for Mingan islands. Specimen not seen, but is probably *P. asarifolia*, var. *incarnata*.

Monotropa uniflora L. Uncommon. Seven Islands: C. B. Robinson, No. 751 (H). Natashkwan: sandy fir woods, C. No. 90,644. Archipel du Gros-Mécatina: île Tête à la Baleine, sphagnum bog, C. No. 90,645.

M. Hypopitys L. Infrequent. Seven Islands: C. B. Robinson, No. 875 (called *Hypopitys lanuginosa* (Michx.) Nutt.) (H). Mingan islands: île Ste. Geneviève, mossy woods, C. No. 90,646.

Ledum grænlanticum Oeder. Bogs and thickets and borders of woods, almost universal. Archipel Ouapitagone: Romaine, edge of thicket, C. No. 90,647. Also collected by C. W. Townsend, C. B. Robinson, Storer, and D. N. Saint-Cyr. Reported by S. R. Butler (B⁵), and L. O. Brunet (B¹).

[*L. latifolium* L.] *L. grænlanticum*.

[*L. palustre* L.] of D. N. Saint-Cyr is *L. grænlanticum*.

[*L. palustre* L., var. *angustifolium* Hook.] recorded by D. N. Saint-Cyr. Specimen not seen.

Rhododendron canadense (L.) BSP. Tundra, bogs, and wet thickets or woods, very common throughout. Lagorgendière: Romaine, tundra, C. No. 90,648. Also collected by C. W. Townsend, D. N. Saint-Cyr, and Verrill, Hyatt, and Shaler.

[*Rhodora canadensis* L.] *Rhododendron canadense*.

Loiseleuria procumbens (L.) Desv. Exposed hilltops and crests, occasional. Mingan islands: D. N. Saint-Cyr (Q). St. Augustin; and Pontchartrain: Vieux-Fort, heath on a raised beach, C. No. 90,650. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen (Hb. Conn. Agric. Exp. Sta., New Haven). Brest: Blanc-Sablon, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 3,828 (H). Reported by S. R. Butler (B⁵) on archipel du Vieux-Fort: île de la Demoiselle.

[*Phyllodoce cærulea* (L.) Bab.] Two collections in the Gray herbarium, one by Dr. Storer, the other by Dr. Bryant, may have come from southern Labrador as did most of their collections, which are marked simply Labrador. Abundant collections show that this genus grows in Labrador, but it is not definitely known on the south shore. As Bryant skirted the coast as far east as Château bay, and as Storer went as far as Red bay, we may assume that each found the plant during the last part of his trip.

[*Kalmia latifolia* L.] Recorded by W. A. Stearns (S¹), "Of this plant Mr. Butler writes me: 'I have found it in ravines and near ponds in the interior, up Salmon river, and on Esquimaux island.' " If the plant in question is a *Kalmia*, it is undoubtedly *K. angustifolia*.

Kalmia angustifolia L. Tundra, bogs, or thickets on hillsides, common as far east as Bonne-Espérance, Seven Islands: C. B. Robinson, No. 769 (H). Mingan seigniory: Mingan, C. W. Townsend (H). Lagorgendière: Romaine, tundra, C. No. 90,652. Archipel de Kécarpoui: île du Petit Rigolet, turfy hillside, C. No. 90,651.

K. polifolia Wang. Bogs, tundra, and wet thickets, abundant throughout. Lagorgendière: Romaine, tundra, C. No. 90,653. Also collected by C. W. Townsend, C. B. Robinson, J. A. Allen, Dr. Storer, and D. N. Saint-Cyr.

[*K. glauca* Ait.] *K. polifolia*.

[*Cassiope tetragona* Don.] Erroneously reported by J. Macoun (M) as collected by S. R. Butler on Caribou island. Neither Butler (B⁵) nor W. A. Stearns (S¹) lists the species.

[*Andromeda polifolia* L.] All records can be considered as *A. glaucophylla*.

Andromeda glaucophylla Link. Tundra, bogs, and wet thickets, very common throughout. Southern Labrador: Storer (H). Mingan seigniory: Mingan, C. W. Townsend (H); Pointe-aux-Esquimaux, open bog, C. No. 90,655, and C. W. Townsend (H); Watshishu, D. N. Saint-Cyr (called *A. polifolia*) (Q).

Chamædaphne calyculata (L.) Moench. Tundra and wet thickets, very common throughout. Mingan islands: Eskimo island, C. W. Townsend (H). Mingan seigniory: Pointe-aux-Esquimaux, tundra, C. No. 90,656. Natashkwan: C. W. Townsend (H).

[*Cassandra calyculata* L.] *Chamædaphne calyculata*.

Arctostaphylos Uva-ursi (L.) Spreng. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: presumably from île du Havre, D. N. Saint-Cyr (Q); Eskimo island, limestone sea-cliffs, C. No. 90,657. Recorded by Verrill, but his plant is the var. *coactilis*.

A. Uva-ursi, var. *coactilis* Fernald and Macbride. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: Verrill, Hyatt, and Shaler (called *A. Uva-ursi*) (Y); île Ste. Geneviève, top of limestone shingle, C. No. 90,658.

A. Uva-ursi, var. *adenotricha* Fernald and Macbride. Seven Islands: C. B. Robinson, No. 732 (called *A. Uva-ursi*) (C and H). Mingan seigniory: Mingan, C. W. Townsend (called *A. Uva-ursi*) (H).

A. alpina (L.) Spreng. Exposed rocky and turfy headlands or hillsides, generally distributed. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Archipel Ouapitagone: Romaine, rocky crests, C. No. 90,659. Gros Mécatina: D. N. Saint-Cyr. Reported by J. B. A. Ferland (F¹), and J. Richardson (R¹).

A. rubra (Rehder and Wilson) Fernald. Mingan islands: Eskimo island, limestone sea-cliffs, C. No. 90,660.

Chiogenes hispidula (L.) T. and G. Thickets and mossy woods, common throughout. Mingan island: D. N. Saint-Cyr (Q). Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Lagorgendière: Romaine, mossy woods, C. No. 90,661.

Vaccinium canadense Kalm. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Reported by D. N. Saint-Cyr, as from Watshishu, July 6, 1882. Specimen not seen.

V. pennsylvanicum Lam. Open places, or borders of woods, very common throughout. Lagorgendière: Romaine, tundra, C. No. 90,662. Also collected by C. B. Robinson, C. W. Townsend, D. N. Saint-Cyr, and Verrill, Hyatt, and Shaler. Reported by J. B. A. Ferland (B¹), and J. Richardson (R¹).

V. pennsylvanicum, var. *myrtilloides* (Michx.) Fernald. Natashkwan: C. W. Townsend (H).

V. pennsylvanicum, var. *angustifolium* (Ait.) Gray. Dry open places, common throughout. Natashkwan: sand dunes, C. Nos. 90,664 and 90,665.

[*V. corymbosum* L.] Recorded from Mingan islands by Verrill (V¹). Specimen not seen, a doubtful record.

V. uliginosum L. Turfy slopes, very common throughout. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Natashkwan: sand dunes, C. No. 90,667. Lagorgendière: Romaine, rocky crest, C. No. 90,666. Recorded by Verrill (V¹), but the plant is of the var. *pubescens*.

V. uliginosum, var. *pubescens* Lange. Common throughout. Seven Islands: C. B. Robinson, No. 690 (H). Mingan islands: Verrill, Hyatt, and Shaler (called *V. uliginosum*) (Y). Mingan seigniory: Pointe-aux-Esquimaux, limestone, rocky headland, C. No. 90,668.

[*V. caespitosum* Michx.] Recorded by S. R. Butler (B⁵). The plant is probably *V. uliginosum*.

[*V. ovalifolium* Sm.] of C. B. Robinson (R²) is *Lonicera caerulea*, var. *calvescens*.

[*V. Vitis-Idæa* L.] All records belong with the var. *minus*.

V. Vitis-Idæa L., var. *minus* Lodd. Rocky or turfy hillsides, very common throughout. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: Verrill, Hyatt, and Shaler (Y). Natashkwan: sand dunes, C. No. 90,669.

V. Oxycoccus L. Tundra and bogs, common throughout. Mingan seigniory: Mingan, D. N. Saint-Cyr (Q). Ile Ouapitagone: tundra, C. No. 90,670. Reported by S. R. Butler (B⁵), I. O. Brunet (B¹), and J. Richardson (R¹).

DIAPENSIACEÆ (DIAPENSIA FAMILY)

Diapensia lapponica L. Rocky summits and turfey hillsides in the Laurentian area, common on the eastern half of the coast. Seven Islands: C. B. Robinson, No. 941 (H). Pontchartrain: Vieux-Fort, rocky summit, C. No. 90,673. In Dr. Wm. Kelly's manuscript list.

PLUMBAGINACEÆ (LEADWORT FAMILY)

Limonium trichogonum S. F. Blake. Southern Labrador: Storer (H). This record may be open to some question, as Storer collected some specimens at the gut of Canso, and these are in no way distinguished from those obtained in Labrador. In spite of its conspicuous nature, no other botanist has succeeded in detecting it in this region. However, a single collection from Newfoundland (see *Rhodora*, XVI, 62, 1916) gives colour to this record of Storer's.

[*Armeria vulgaris* Willd.] In Macoun's Cat. Can., Pl. i, 564 (1886) this species is reported from "Mingan islands, and on Grand Mécatina island, gulf of St. Lawrence (St. Cyr)." Saint-Cyr does not list this species in either of his two publications cited here, consequently, for want of confirmation, this record is discredited.

PRIMULACEÆ (PRIMROSE FAMILY)

Primula farinosa L. Archipel du Vieux-Fort: Bonne-Espérance, J. A. Allen (Hb. Conn. Agric. Exp. Sta., New Haven). All the other records for this species belong to one of its varieties.

Primula farinosa L., var. *macropoda* Fernald. Calcareous ledges, or turfey slopes of outer islands. Southern Labrador: Storer (H); Dr. Bryant (H). Mingan seigniory: Pointe-aux-Esquimaux, rocky limestone headland, C. No. 90,674.

P. farinosa, var. *incana* (M. E. Jones) Fernald. Ledges and turfey slopes of the headlands and outer islands. Mingan seigniory: Mingan, C. W. Townsend (H). Mingan islands: Eskimo island, C. W. Townsend (H). Goynish: îles Boisées de cap Blanc, Washtawouka, rocky shore, C. No. 90,675.

P. mistassinica Michx. Infrequent. Mingan seigniory: Pointe-aux-Esquimaux, swampy brookside, C. No. 90,676, and C. W. Townsend (H). Mingan islands: D. N. Saint-Cyr (Q). Reported by S. R. Butler (B⁵) from archipel du Vieux-Fort: Fox island, near île de la Demoiselle. In Dr. Wm. Kelly's manuscript list.

P. egallicensis Wormskj. ex Lehman. Charnay: pointe au Maurier, mossy bank on island off, C. No. 90,677. This seems to be the first record for the plant south of cape St. Charles, on the Labrador coast.

Androsace septentrionalis L. Mingan islands: île Ste. Geneviève, D. N. Saint-Cyr (Q). In Dr. Wm. Kelly's manuscript list.

A. septentrionalis L., var. *robusta* St. John. Mingan islands: Eskimo island, limestone sea-cliff, C. No. 90,815; île Ste. Geneviève, top of limestone shingle. C. No. 90,814.

[*A. occidentalis* Pursh] of D. N. Saint-Cyr is *A. septentrionalis* L.

Lysimachia terrestris (L.) BSP. Rare. Mingan, and Charnay : rivière Etamamiou, grassy bank, C. No. 90,678.

Trientalis borealis Raf. Mossy woods and turfy hillsides, extremely abundant throughout. Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Natashkwan river: C. W. Townsend (H). Lagorgendière: Romaine, mossy woods, C. No. 90,679. Recorded by S. R. Butler (B⁵).

[*Glaux maritima* L.] of D. N. Saint-Cyr is the var. *obtusifolia*.

Glaux maritima L., var. *obtusifolia* Fernald. Saline marshes, occasional as far east as pointe au Maurier. Seven Islands: C. B. Robinson, No. 924 (C and H). Mingan seigniory: Watshishu, D. N. Saint-Cyr (Q). Natashkwan river: C. W. Townsend (H). Charnay: pointe au Maurier, gravelly shore, C. No. 90,680.

OLEACEÆ (OLIVE FAMILY)

[*Fraxinus sambucifolia* Lam.] Indicated by R. Bell (B⁴) as growing throughout the southern part of Saguenay co. There seems to be no evidence to support this.

GENTIANACEÆ (GENTIAN FAMILY)

Gentiana nesophila Holm. Mingan islands: ile à la Chasse, rocky limestone seashore, C. No. 90,681. *G. crinita* of Dr. Wm. Kelly's manuscript list is undoubtedly of this species.

G. Amarella L. Rocky, sandy, or turfy slopes, abundant in the calcareous region of Mingan islands and the strait of Belle Isle. Mingan seigniory: Pointe-aux-Ésquimaux, mossy limestone rocks, C. No. 90,684. Mingan islands: île Ste. Geneviève, top of limestone shingle, C. No. 90,683. Brest: anse des Dunes, grassy hollow, C. No. 90,682.

Reported by S. R. Butler (B⁵) from archipel du Vieux-Fort: île de la Demoiselle.

[*G. acuta* Michx.] *G. Amarella*.

G. propinqua Richards. Credited in Macoun: Cat. Can. Pl. i, 322 (1884) to "On hillsides at Amour and lowlands at Bonne-Espérance, Labrador (W. A. Stearns). Labrador. (Gray.)" This latter reference is based on a plant of S. R. Butler's from Forteau bay, which seems to be correctly identified. The former sheet is presumably in the U.S. National herbarium, but when the writer tried to borrow this sheet it could not be found. The existence of Butler's plant from Forteau bay, which is only 30 miles from Bonne-Espérance, gives colour to Stearn's record from the southern shore of the peninsula. Hence, with little question, this species is included in the list.

Lomatogonium rotatum (L.) Fries, f. *americanum* (Griseb.) Fernald. Sandy or turfy shores, all along the coast. Southern Labrador: Storer (H). Charnay: pointe au Maurier, turfy edge of sand beach, C. No. 90,685. Archipel de Kécarpoui: îles Affligées, turfy shore, C. No. 90,686. Brest: Blanc-Sablon, brackish shore, M. L. Fernald and K. M. Wiegand, Nos. 3,906 and 3,907 (H). Reported by S. R. Butler (B⁵), and L. O. Brunet (B¹).

[*Pleurogyne rotata* (L.) Griseb.] All records are to be considered as *Lomatogonium rotatum*, f. *americanum*.

Halenia deflexa (Sm.) Griseb. Turfy shores and hillsides near the sea, very common all along the coast. Ile Kécarpoui: turfey shore, C. No. 90,687. Also collected by C. W. Townsend, Storer, D. N. Saint-Cyr, and Fernald and Wiegand.

Menyanthes trifoliata L. Marshes, bogs, and borders of ponds, very common throughout. Mingan islands: D. N. Saint-Cyr (Q). Archipel Washicoutai: île Triple, edge of pool in rocks, C. No. 90,689.

BORAGINACEÆ (BORAGE FAMILY)

Mertensia maritima (L.) S. F. Gray. Gravel beaches, all along the shore. Seven Islands: C. B. Robinson, No. 730 (H). Mingan seigniory: Mingan, C. W. Townsend (H). Archipel du Vieux-Fort: île Herbée, gravel beach, C. No. 90,691.

LABIATÆ (MINT FAMILY)

Scutellaria galericulata L. Infrequent. Mingan islands: île à l'Ancre, limestone shingle, C. No. 90,694. Boishébert: Tabatière, meadow, C. No. 90,693. In Dr. Wm. Kelly's manuscript list.

GALEOPSIS TETRAHIT L. Introduced. Chevalier: St. Paul, grassy shore, C. No. 90,695. A collection from Mingan: C. W. Townsend (H) is very young and might equally well be var. *bifida*.

G. TETRAHIT, var. BIFIDA (Boenn.) Lej. and Cout. Introduced at many stations. Boishébert: Tabatière, dooryard, C. No. 90,696.

Lycopus uniflorus Michx. Infrequent. Seven Islands: C. B. Robinson, No. 914 (H). Natashkwan: wet dune hollow, C. No. 90,698. Char-nay: rivière Etamamiou, swale, C. No. 90,697.

SCROPHULARIACEÆ (FIGWORT FAMILY)

[*Chelone glabra* L.] Reported from Mingan islands: Eskimo island, D. N. Saint-Cyr, July 27, 1882. Specimen not seen.

Limosella aquatica L. Archipel Ouapitagone: île du Havre, Romaine, wet mud, C. No. 90,699. Anse portage; and Brest: anse des Dunes, sandy pond shore, C. No. 90,700. Archipel du Vieux-Fort: Bonne-Espérance, hollows of rocks filled with fresh water, J. A. Allen (Hb. Conn. Agric. Exp. Sta., New Haven). Found at Square islands on the eastern coast of Labrador by J. A. Allen, the nearest station being York Factory, Hudson bay, and from there it is general to the west and south. The var. *tenuifolia* is not known from the area.

Veronica scutellata L. Natashkwan: wet dune hollow, C. No. 90,701.

V. SERPYLLIFOLIA L. Introduced. Mingan seigniory: Pointe-aux-Esquimaux, rocky limestone headland, C. No. 90,702.

V. *humifusa* Dickson. Deep mossy woods, occasional. Southern Labrador: Dr. Bryant (H). Lagorgendière: Romaine, wooded river-bank, C. No. 90,703. Brest: Jones point, brookside, C. No. 90,704.

Melampyrum lineare Lam. Dry thickets and dry turfey hillsides, occasional. Seven Islands: C. B. Robinson, No. 838 (H). Natashkwan river: C. W. Townsend (H). Brouague: Petite rivière Coxipi, dry, mossy hillside, C. No. 90,705. Archipel de St. Augustin: Bayfield island, sunny, mossy bank, C. No. 90,706.

Euphrasia purpurea Reeks. Occasional. Natashkwan; and Lagorgendière: Romaine, turfy bank, C. No. 90,711. Charnay: pointe au Maurier, edge of brackish marsh, C. No. 90,710.

E. purpurea, f. *candida* Fernald and Wiegand. Seven Islands: east side of Grande Basque, on anorthosite, C. B. Robinson, No. 943 (C and H).

E. purpurea, var. *Farlowii* (Robinson) Fernald and Wiegand. Archipel du Petit-Mécatina: îles Netagamou, grassy ledge, C. Nos. 90,712 and 90,713.

E. purpurea, var. *Randii* (Robinson) Fernald and Wiegand. Reported from Seven Islands by C. B. Robinson (R²) (called *E. Randii*). Specimen not seen.

[*E. Randii* Robinson.] *E. purpurea*, var. *Randii*.

E. disjuncta Fernald and Wiegand. Turfy hillsides, common. Brest: Jones point, grassy shore, C. No. 90,714. Also collected by J. A. Allen, Storer, and Fernald and Wiegand.

E. arctica Lange. Archipel du Petit-Mécatina: îles Netagamou, grassy ledge, C. No. 90,717.

E. stricta Host, var. *tatarica* (Fischer) Fernald and Wiegand. Mingan seigniory: Betchouane, grassy shore, C. No. 90,719. Natashkwan: grassy shore, C. No. 90,718.

[*E. canadensis* Townsend.] Recorded from Mingan islands by D. N. Saint-Cyr. In the collection (Q) there is a cover of *Euphrasia* labelled Quebec, July, 1883, and Mingan island, July 30, 1882. Within are two sheets, on one is a loose ticket saying Citadelle Quebec, Tout l'été, and île d'Orleans, August 28, 1883. The other is a sheet of *E. canadensis* without data, but presumably from Mingan islands.

[*E. officinalis* L.] of D. N. Saint-Cyr is *E. canadensis*. Reported by S. R. Butler (B⁵), and L. O. Brunet (B¹). It is impossible to say without an examination what these may be.

Rhinanthus. The North American species are so imperfectly understood, and the specimens in drying lose so many of their characters, that no attempt has been made to correlate the various published records when the actual specimens have not been examined.

[*R. Crista-galli* L.] A specimen from Seven Islands: C. B. Robinson, is so labelled. Reported by S. R. Butler (B⁵).

R. oblongifolius Fernald. A collection by Storer is so named.

R. Kyrollæ Chabert. Grassy shores and turfy hillsides, common throughout. Lagorgendière: Romaine, grassy shore, C. No. 90,709. Archipel de St. Augustin: Bayfield island, grass covered dunes, C. No. 90,708. Pontchartrain: Vieux-Fort, grassy shore, C. No. 90,707.

LENTIBULARIACEÆ (BLADDERWORT FAMILY)

Utricularia vulgaris L., var. *americana* Gray. Shallow ponds and streams, in the calcareous region of Mingan islands, and strait of Belle Isle. Pointe-aux-Esquimaux: île à la Chasse; and Brest: rivière Blanc-Sablon, shallow sandy-bottomed pools, M. L. Fernald and K. M. Wiegand, No. 4,006 and C. No. 90,720.

U. minor L. Lagorgendière: Romaine, pool in tundra, C. No. 90,721. Brest: Blanc-Sablon, springy holes in bogs, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 4,007. †

U. intermedia Hayne. Pointe-aux-Esquimaux; and Mingan islands: île à la Chasse, shallow pool, C. No. 90,722.

U. cornuta Michx. Mingan seigniory: Mingan, and Pointe-aux-Esquimaux, edge of pool in tundra, C. No. 90,723.

Pinguicula vulgaris L. Abundant on the limy ledges of Mingan islands and strait of Belle Isle, and occasional on the turfy slopes of the outer islands in the Laurentian area. Southern Labrador: Storer (H). Mingan islands: Verrill, Hyatt, and Shaler (Y); Eskimo island, wet limestone sea-cliffs, C. No. 90,728 and 90,729. Archipel Ouapitagone: île Matchiatik, cleft in rocks, C. No. 90,724. Charnay: pointe au Maurier, mossy bank on island off, C. No. 90,725. Ile Kécarpoui: turfy hillside, C. No. 90,726. Brest: Longue pointe, turfy edge of pond, C. No. 90,727. Reported by D. N. Saint-Cyr, and S. R. Butler (B⁵).

P. alpina L. W. A. Stearns writes (S¹), "In a letter Mr. Butler says: 'There is a *Pinguicula* which you have omitted, and I believe *stricta* was the specific name, a low, white-flowered species; it grew both at Bonne-Espérance and the neighbouring islands and Forteau.' I did not find it, and it was omitted from his list." The plant is evidently *P. alpina*. There seems to be only one other record of this species from North America, Gray, Synopt. Fl. N. Am., ii, pt. i, 317 (1886), which is discredited in Britton and Brown, Ill. Fl., iii, 226 (1913). The specimen is in the Gray herbarium and is marked, "In Hb. Durand, as from Le Conte to Collins, Labrador (coll. Steinhauer)."

PLANTAGINACEÆ (PLANTAIN FAMILY)

PLANTAGO MAJOR L. Introduced. Mingan seigniory: Pointe-aux-Esquimaux, roadside, C. No. 90,730. Recorded by Verrill (V¹) from Mingan islands, July 10, 1861.

P. decipiens Barneoud. Saline shores, very common throughout. Archipel de St. Augustin: île des Génévriers, rocky beach, C. No. 90,731. Also collected by D. N. Saint-Cyr, Storer, J. A. Allen, C. B. Robinson, C. W. Townsend, and Verrill, Hyatt, and Shaler.

[*P. maritima* L.] *P. decipiens*.

[*P. pauciflora* Pursh.] *P. decipiens*.

RUBIACEÆ (MADDER FAMILY)

Galium palustre L. Mingan islands: Eskimo island, D. N. Saint-Cyr (called *G. pusillum*) (Q).

[*G. pusillum* Gray] of D. N. Saint-Cyr is *G. palustre*.

[*G. trifidum* L., var. *pusillum* Gray.] Recorded by S. R. Butler (B⁵), Miss Macfarlane, No. 25. The plant is probably *G. palustre*.

G. trifidum L., var. *halophilum* Fernald and Wiegand. Brackish shores, apparently throughout. Archipel Washicoutai: île Triple, wet sod, C. No. 90,333. Charnay: rivière Etamamiou, brackish marsh, C. No. 90,332. Brest: Blanc-Sablon, brackish shore, M. L. Fernald and K. M. Wiegand, No. 4,035 (H).

G. Claytoni Michx. Natashkwan: edge of slough in sand dunes, C. No. 90,734.

G. labradoricum Wiegand. Natashkwan river: C. W. Townsend (H). Archipel de St. Augustin: Bayfield island, edge of thicket, C. No. 90,735. Brest: Blanc-Sablon, in wet sand on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 4,045 (H). Southern Labrador: Storer (H).

G. triflorum Michx. Boishébert: baie des Moutons, grassy hillside, C. No. 90,736. St. Augustin river: alder thicket, C. No. 90,737. In Dr. Wm. Kelly's manuscript list.

CAPRIFOLIACEÆ (HONEYSUCKLE FAMILY)

Diervilla Lonicera Mill. Seven Islands: C. B. Robinson, No. 890 (C and H).

[*Lonicera cærulea* L.] All records belong with the var. *villosa*.

Lonicera cærulea L., var. *villosa* (Michx.) T. and G. Wet thickets or turfy hillsides, common throughout. Mingan seigniory: Mingan, and Pointe-aux-Esquimaux, C. W. Townsend (H). Mingan islands: île du Havre, D. N. Saint-Cyr (called *L. cærulea*) (Q). Lagorgendière: Romaine, grassy shore, C. No. 90,738. Brest: Blanc-Sablon, in dry or wet places on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 4,054 (H).

L. cærulea, var. *calvescens* Fernald and Wiegand. Seven Islands: C. B. Robinson, No. 688 (called *Vaccinium ovalifolium*) (H).

L. canadensis Marsh. Recorded from Mingan islands: île du Havre, July 25, 1882. D. N. Saint-Cyr (as *L. ciliata*). Specimen not seen, but is probably all right.

[*L. ciliata* Muhl.] For record of D. N. Saint-Cyr see *L. canadensis*.

[*Linnæa borealis* Gronov.] All records belong with the var. *americana*.

Linnæa borealis L., var. *americana* (Forbes) Rehder. Woods or sunny banks, extremely abundant throughout. St. Augustin river: mossy evergreen woods, C. No. 90,740. Also collected by C. W. Townsend, C. B. Robinson, and Storer. Reported by D. N. Saint-Cyr, J. Richardson (R¹), S. R. Butler (B⁵), and Verrill (V¹).

Viburnum pauciflorum Raf. Thickets and borders of woods, generally distributed, but especially common and luxuriant in the calcareous region of Mingan islands and strait of Belle Isle. Southern Labrador: Dr. Bryant (H). Mingan seigniory: Mingan river, D. N. Saint-Cyr (Q); Mingan, C. W. Townsend (H). Mingan islands: Verrill, Hyatt, and Shaler (Y); Eskimo island, wooded bank, C. No. 90,742; île Ste. Geneviève, edge of woods, C. No. 90,741. Lagorgendière: Romaine, wooded bottomland C. No. 90,743.

V. cassinoides L. Mingan seigniory: granite hills back of Mingan, C. No. 90,744. Natashkwan river: C. W. Townsend (H).

CAMPANULACEÆ (BLUEBELL FAMILY)

Campanula rotundifolia L. Rocky or turfy shores and hilltops, common, especially near the coast. Southern Labrador: Storer (H). Seven Islands: C. B. Robinson (H). Natashkwan river: C. W. Townsend (H). Boishébert: Tabatière, rocky shore, C. No. 90,747.

[*C. linifolia* Lam.] *C. rotundifolia*.

Lobelia Dortmanna L. Brouague: Petite rivière Coxipi, in 1 foot of water, sandy-bottomed pond. C. No. 90,748. Also at Brest.

COMPOSITÆ (COMPOSITE FAMILY)

Eupatorium purpureum L., var. *maculatum* (L.) Darl. Mingan seigniory: Mingan river, sand bar in, C. No. 90,749.

[*Solidago squarrosa* Muhl.] of D. N. Saint-Cyr is *S. rugosa* var. *villosa*.

Solidago hispida Muhl. Mingan islands: île Ste. Geneviève, limestone sea-cliffs, C. No. 90,750.

S. macrophylla Pursh. Thickets and borders of woods, common throughout. Southern Labrador: Storer (H). Seven Islands: C. B. Robinson, No. 780 (H and C). Brouague: Shekatika river, rocky isle in, C. No. 90,752. Pontchartrain: Vieux-Fort, edge of thicket on hillside, C. No. 90,751.

S. macrophylla, var. *thyrsoides* (Mey.) Fernald. Probably common throughout. Archipel de Kécarpoui: île du Petit Rigolet, edge of thicket, C. No. 90,753. Archipel du Blanc-Sablon: Greenly island, J. A. Allen (Hb. Conn. Agric. Exp. Sta., New Haven).

S. humilis Pursh (*S. uliginosa* Nutt.) Tundra and bogs, probably common throughout. Mingan islands: île Ste. Geneviève, open bog, C. No. 90,755. Natashkwan: Little Natashkwan river, boggy shore, C. No. 90,754.

S. rugosa Mill., var. *villosa* (Pursh) Fernald. Mingan seigniory: rivière au Tonnerre, D. N. Saint-Cyr (called *S. squarrosa*) (Q).

S. lepida DC., var. *elongata* (Nutt.) Fernald. St. Augustin river: thicket on sandy isle in river, C. No. 90,756.

S. graminifolia (L.) Salisb. Mingan seigniory: sand bar in Mingan river, C. No. 90,757.

[*Aster radula* Ait.] Recorded by S. R. Butler (B⁵). The plant is probably of the var. *strictus*.

Aster radula Ait., var. *strictus* (Pursh) Gray. Turfy hillsides, occasional throughout. Southern Labrador: Storer (H). Boishébert: baie des Moutons, turfey hillside, C. Nos. 90,758 and 90,759. Brest: Blanc-Sablon, dry thicket, C. No. 90,760.

A. foliaceus Lindl. Shores and hillsides, common throughout. Southern Labrador: Storer (H). Archipel du Petit-Mécatina: îles Neta-gamiou, rocky shore, C. No. 90,762. Boishébert: Tabatière, rocky shore, C. No. 90,761. Archipel de Kécarpoui: île de Petit Rigolet, grassy shore, C. No. 90,763. St. Augustin river: sandy isle in river, C. No. 90,764.

A. puniceus L., var. *firmus* (Nees) T. and G. Mingan seigniory: Sheldrake river, D. N. Saint-Cyr (Q).

A. puniceus, var. *oligocephalus* Fernald. Ile Gros-Mécatina: thicket on hillside, C. No. 90,766.

A. umbellatus Mill. Turfy slopes, occasional as far east as île Tête à la Baleine. Southern Labrador: Storer (H). Mingan seigniory: Sheldrake river, D. N. Saint-Cyr (Q). Natashkwan river: C. W. Townsend (H). Pointe au Maurier, and archipel du Gros-Mécatina: île Tête à la Baleine, turfey brookside, C. No. 90,767.

A. acuminatus Michx. Southern Labrador: Storer (H).

A. nemoralis Ait. Occasional on the tundra as far east as île Tête à la Baleine. Mingan seigniory: Sheldrake, D. N. Saint-Cyr (Q). Natashkwan river: C. W. Townsend (H). Pointe au Maurier. Archipel du Gros-Mécatina: île Tête à la Baleine, turfy brookside, C. No. 90,767.

[*Antennaria alpina* Gaertn.] Erroneously recorded by J. Macoun (M) as collected on Caribou island by S. R. Butler. Neither Butler (B⁵) nor W. A. Stearns (S¹) list the species.

A. spathulata Fernald, var. *continentis* Fernald and St. John. Natashkwan: sand dunes, C. No. 90,768.

A. glabrifolia Fernald. Natashkwan: sand dunes, C. No. 90,769.

Anaphalis margaritacea (L.) Benth. and Hook., var. *subalpina* Gray. Mingan islands: île Ste. Geneviève, grassy clearing, C. No. 90,770.

A. margaritacea, var. *occidentalis* Greene. Observed on Mingan islands.

GNAPHALIUM ULIGINOSUM L. Introduced. Natashkwan: track in sand dunes, C. No. 90,771.

ACHILLEA MILLEFOLIUM L. Introduced. Mingan seigniory: Mingan, D. N. Saint-Cyr (Q).

A. Millefolium, var. *nigrescens* E. Mey. Grassy or rocky shores, common throughout. Seven Islands: C. B. Robinson, No. 810 (H). Mingan islands: île à la Chasse, rocky limestone shore, C. No. 90,772. Natashkwan river: 70 miles up from mouth, C. W. Townsend (H). Brest: Blanc-Sablon, abundant in damp sand on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 4,156 (H).

TANACETUM VULGARE L. Mingan seigniory: Pointe-aux-Esquimaux, and grassy clearing, Betchouane, C. No. 90,774.

Artemisia canadensis Michx. Mingan seigniory: Mingan river, sand flat in, C. No. 90,775. Natashkwan river: C. W. Townsend (H).

Petasites palmata (Ait.) Gray. Grassy banks, calcareous region of Mingan islands and strait of Belle Isle. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H); Betchouane, meadow, C. No. 90,776. Brest: Blanc-Sablon, wet, mossy places, limestone and calcareous sandstone terraces, M. L. Fernald and K. M. Wiegand, No. 4,168 (H).

SENECIO VULGARIS L. Introduced. Seven Islands: C. B. Robinson No. 803 (H). Mingan seigniory: Sheldrake river, D. N. Saint-Cyr (Q). Boishébert: baie des Moutons, rocky shore near a wharf, C. No. 90,777.

S. palustris (L.) Hook. Wet shores of outer islands and headlands. Pointe au Maurier; îles Netagamiou; and archipel de Kécarpoui: îles Affligées, rocky shore, C. No. 90,778.

S. pauciflorus Pursh. Brest: Jones point, little swales near summit of limy ridge, C. No. 90,779.

S. aureus L., var.? Mingan seigniory: Betchouane, meadow, C. No. 90,780. This is the variant of *S. aureus* that is characteristic of the calcareous regions bordering the gulf of St. Lawrence.

[*S. aureus*, var. *Balsamitæ* Gray.] Recorded by S. R. Butler (B⁵). The plant in question is probably *S. pauperculus*.

S. pauperculus Michx. Rocky shores and meadows in the calcareous region of Mingan islands and strait of Belle Isle. Mingan seigniory: Betchouane, rocky limestone shore, C. No. 90,782. Brest: anse des Dunes, grassy hollow, C. No. 90,781.

S. Pseudo-Arnica Less. Saline shores, very common all along the coast. Seven Islands: C. B. Robinson, No. 793 (H). Mingan islands: île du Havre, D. N. Saint-Cyr (Q). Archipel du Gros-Mécatina: île Tête à la Baleine, grassy dune, C. No. 90,783.

Cirsium muticum Michx. Brest: rivière Blanc-Sablon, thicket by, C. No. 90,786.

C. muticum, var. *monticola* Fernald. Mingan islands: île Ste. Geneviève, boggy woods, C. No. 90,787. This collection is treated as var. *monticola* because of the congestion of the inflorescence, in spite of the fact that the involucre is cobwebby.

C. ARVENSE (L.) Scop. Introduced. Mingan seigniory: Pointe-aux-Esquimaux, and grassy clearing, Betchouane, C. No. 90,785.

LEONTODON AUTUMNALIS L. Introduced at several places. Mingan seigniory: rivière au Tonnerre, D. N. Saint-Cyr (Q). Natashkwan: grassy shore, C. No. 90,788.

TARAXACUM OFFICINALE Weber. Introduced at several places. Mingan seigniory: Pointe-aux-Esquimaux, C. W. Townsend (H); Watshishu, D. N. Saint-Cyr (called *T. dens-leonis*) (Q). Natashkwan: roadside, C. No. 90,789.

[*Taraxacum officinale* Weber, var. *alpinum* Koch.] Erroneously recorded by Macoun (M) as collected by S. R. Butler at Caribou island. Butler (B⁵) does not list the plant.

[*T. dens-leonis* Desf.] *T. officinale*.

T. ceratophorum (Ledeb.) DC. Open slopes in the calcareous region of strait of Belle Isle. Archipel du Blanc-Sablon: Greenly island, J. A. Allen (Hb. Conn. Agric. Exp. Sta., New Haven). Brest: Jones point, and rivière à la Truite, grassy hillside, C. Nos. 90,790 and 90,791.

Lactuca spicata (Lam.) Hitchc. Legardeur: Coacoachou, grassy shore, C. No. 90,792.

Prenanthes racemosa Michx. Turfy shores, occasional as far east as Romaine. Seven Islands: C. B. Robinson, No. 784 (H). Ile Ste. Geneviève; île à la Chasse; Betchouane; and Lagorgendière: Romaine, rocky headland, C. No. 90,793. In Dr. Wm. Kelly's manuscript list.

P. nana (Bigel.) Torr. Turfy slopes, occasional. Southern Labrador: Storer (H). Betchouane; and Brest: rivière à la Truite, rocky hillside, C. No. 90,794; Blanc-Sablon, on the gneiss plain, M. L. Fernald and K. M. Wiegand, No. 4,224 (H).

Hieracium canadense Michx. Mingan seigniory: Betchouane, grassy shore, C. No. 90,795. Lagorgendière: Romaine, grassy bank, C. No. 90,796.

TABLE OF FAMILIES, SPECIES, VARIETIES, AND FORMS

Families	Native			Introduced			Total
	Species	Varieties	Forms	Species	Varieties	Forms	
<i>Polypodiaceæ</i>	14	1	0	0	0	0	15
<i>Osmundaceæ</i>	2	0	0	0	0	0	2
<i>Ophioglossaceæ</i>	3	2	0	0	0	0	5
<i>Equisetaceæ</i>	4	6	0	0	0	0	10
<i>Lycopodiaceæ</i>	6	7	0	0	0	0	13
<i>Selaginellaceæ</i>	2	0	0	0	0	0	2
<i>Isoëtaceæ</i>	0	1	0	0	0	0	1
<i>Taxaceæ</i>	1	0	0	0	0	0	1
<i>Pinaceæ</i>	6	1	0	0	0	0	7
<i>Sparganiaceæ</i>	3	0	0	0	0	0	3
<i>Potamogetonaceæ</i>	9	8	0	0	0	0	17
<i>Juncaginaceæ</i>	3	0	0	0	0	0	3
<i>Alismaceæ</i>	1	0	0	0	0	0	1
<i>Gramineæ</i>	36	16	1	5	0	0	58
<i>Cyperaceæ</i>	58	18	0	0	0	0	76
<i>Araceæ</i>	1	0	0	0	0	0	1
<i>Lemnaceæ</i>	1	0	0	0	0	0	1
<i>Eriocaulaceæ</i>	1	0	0	0	0	0	1
<i>Juncaceæ</i>	10	6	0	1	0	0	17
<i>Liliaceæ</i>	9	0	0	1	0	0	10
<i>Iridaceæ</i>	2	1	0	0	0	0	3
<i>Orchidaceæ</i>	12	1	0	0	0	0	13
<i>Salicaceæ</i>	17	2	1	0	0	0	20
<i>Myricaceæ</i>	1	0	0	0	0	0	1
<i>Betulaceæ</i>	6	5	1	0	0	0	12
<i>Urticaceæ</i>	2	0	0	0	0	0	2
<i>Santalaceæ</i>	2	0	0	0	0	0	2
<i>Polygonaceæ</i>	7	0	0	5	0	0	12
<i>Chenopodiaceæ</i>	2	2	0	1	0	0	5
<i>Caryophyllaceæ</i>	14	8	0	3	0	0	25
<i>Portulacaceæ</i>	2	0	0	0	0	0	2
<i>Nymphaeaceæ</i>	1	0	0	0	0	0	1
<i>Ranunculaceæ</i>	11	2	2	2	1	0	18
<i>Fumariaceæ</i>	1	0	0	0	0	0	1
<i>Cruciferae</i>	15	3	0	4	0	0	22
<i>Sarraceniacæ</i>	1	0	0	0	0	0	1
<i>Droseraceæ</i>	3	0	0	0	0	0	3
<i>Crassulaceæ</i>	2	0	0	0	0	0	2
<i>Saxifragaceæ</i>	12	2	0	0	0	0	14
<i>Rosaceæ</i>	19	12	1	0	0	0	32
<i>Leguminosæ</i>	1	1	0	5	0	0	7
<i>Oxalidaceæ</i>	1	0	0	1	0	0	2
<i>Callitrichaceæ</i>	3	0	0	0	0	0	3
<i>Empetraceæ</i>	3	0	0	0	0	0	3
<i>Aquifoliaceæ</i>	1	0	0	0	0	0	1
<i>Aceraceæ</i>	1	0	0	0	0	0	1
<i>Balsaminaceæ</i>	1	0	0	0	0	0	1
<i>Rhamnaceæ</i>	1	0	0	0	0	0	1
<i>Guttiferæ</i>	2	0	0	0	0	0	2
<i>Cistaceæ</i>	0	1	0	0	0	0	1
<i>Violaceæ</i>	7	1	0	0	0	0	8
<i>Elæagnaceæ</i>	1	0	0	0	0	0	1
<i>Onagraceæ</i>	6	2	1	0	0	0	9
<i>Haloragidaceæ</i>	2	1	0	0	0	0	3
<i>Araliaceæ</i>	2	0	0	0	0	0	2
<i>Umbelliferæ</i>	5	0	0	0	0	0	5
<i>Cornaceæ</i>	3	0	0	0	0	0	3
<i>Ericaceæ</i>	20	8	0	0	0	0	28
<i>Diapensiaceæ</i>	1	0	0	0	0	0	1
<i>Plumbaginaceæ</i>	1	0	0	0	0	0	1
<i>Primulaceæ</i>	6	4	0	0	0	0	10
<i>Gentianaceæ</i>	5	1	0	0	0	0	6

TABLE OF FAMILIES, SPECIES, VARIETIES, AND FORMS
—Concluded

Families	Native			Introduced			Total
	Species	Varieties	Forms	Species	Varieties	Forms	
<i>Boraginaceæ</i>	1	0	0	0	0	0	1
<i>Labiataæ</i>	2	0	0	1	1	0	4
<i>Scrophulariaceæ</i>	9	3	1	1	0	0	14
<i>Lentibulariaceæ</i>	5	1	0	0	0	0	6
<i>Plantaginaceæ</i>	1	0	0	1	0	0	2
<i>Rubiaceæ</i>	4	1	0	0	0	0	5
<i>Caprifoliaceæ</i>	4	3	0	0	0	0	7
<i>Campanulaceæ</i>	2	0	0	0	0	0	2
<i>Compositæ</i>	22	12	0	7	0	0	41
Total.....	424	142	8	38	2	0	614

Species and varieties recorded, but excluded—206.

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Audubon, Maria R.—“Audubon and his journals (1897).” Audubon’s Labrador journal forms a part of this, and in it are numerous references to plants.

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Bell, Robert.—“The northern limits of the principal forest trees of Canada east of the Rocky mountains,” Geol. Surv., Can., 38C–56C and map (1879–80). On the map of distribution the northern limits of the trees are indicated by a definite line. While representing various northern outposts of a species, Bell has assumed that a smooth line connecting these outposts represents the northern limits of that species. This method often means, however, that species will be credited to regions where they are not known to grow, and this seems to be particularly true of the region in question.

Billings, B., jun.—See Richardson, James

Brunet, l’Abbé Louis Ovide.—“Catalogue des Plantes Canadiennes, contenues dans l’herbier de l’Université Laval,” 1–64 (1865). This contains references to plants collected in the area, especially by Commandant Fortin. (B².)

Brunet, L. O.—“Notes sur les Plantes, recueilliés en 1858, par M. l’Abbé Ferland sur les côtes de Labrador, baignées par les eaux du Saint-Laurent,” 1–8. Quebec, 18—. This contains an annotated list of 23 species, in most cases found near Tabatière. (B¹.)

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Butler, Rev. S. R.—“Labrador Plants,” *Canadian Nat.*, v, 350–3 (1870). This is an annotated list of plants collected in the neighbourhood of the strait of Belle Isle, published by D. A. Watt. “He collected neither pines, willows, nor glumaceous plants, and . . . his more obscure species were named for him by Prof. Eaton, of New Haven.” Several collections in the same region by a Miss Macfarlane are incorporated. The list contains 135 species of vascular plants. (B⁵.)

Drummond, Andrew Thomas.—“How plant life is distributed in Canada and why,” *Trans. Can. Inst.*, viii, 23–39 (1905).

Ferland, l'Abbé Jean Baptiste Antoine.—“Le Labrador, notes et récits de voyage,” 1858? Pp. 42–44 contain an account of the vegetation nearly identical with that in (B¹), with one additional species, *Amelanchier canadensis*. (F¹.)

Fernald, Merritt Lyndon.—“A botanical expedition to Newfoundland and southern Labrador,” *Rhodora*, xiii, 109–62 (1911). Prof. Fernald gives an account of his five days' botanizing at Blanc-Sablon. The characteristics of the place and the flora are described. He mentions 81 species, and he has allowed the use of an unpublished list of the species he collected there, 237 in all. These plants are now in the Gray herbarium. His companion, Prof. Wiegand, visited Blanc-Sablon in September and made further collections.

Fernald, M. L., and Sornborger, J. D.—“Some recent additions to the Labrador Flora,” *Ottawa Naturalist*, xiii, 89–107 (1899). Although this is primarily a report on collections made on the eastern coast of Labrador, it includes notes on some of the plants collected along the north shore of the gulf by S. R. Butler, Dr. Storer, J. A. Allen, Martin, and Bryant.

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Low, Albert Peter.—“Report on explorations in the Labrador peninsula,” *Geol. Surv., Can.*, viii (1895). Pages 30L–40L contain a discussion of the distribution of trees and other plants in northern Quebec.

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Macoun, John.—“Catalogue of the plants reported by various travelers as growing on the coast of Labrador,” Chap. xvi, pp. 448–474 in Packard, Alpheus Spring.—“The Labrador coast” (1891). The list given is principally of the plants of Labrador, but it contains the plants cited in the works of S. R. Butler, W. A. Stearns, and J. B. A. Brunet. (M.)

Macoun, John, and Gibson, John B.—“Synopsis of the flora of the valley of the St. Lawrence and the Great Lakes, with description of the rarer species,” *Canadian Journal*, xv, 51–66, 161–176, 249–264, 429–435, 546–556 (1876–7). This list included the plants cited by L. O. Brunet, A. E. Verrill, J. Richardson, and S. R. Butler.

Packard, Alpheus Spring.—“The Labrador coast,” 1–513 (1891). Chapter iv, “Life and Nature in southern Labrador”; this first appeared in *Am. Naturalist*, xix, 269–275, 365–372 (1885); and Chap. V, “One of fifty days in southern Labrador.” In these are mentioned 28 species, all very common plants, which were observed on Caribou island (île de la Demoiselle) or at Salmon bay (baie au Saumon). Chap. xvi, “The botany of the Labrador coast,” see Macoun, John.

Richardson, James (erroneously printed John).—“List of plants collected on the island of Anticosti and the coast of Labrador, in 1860,” *Ann. Bot. Soc. Can.*, i, 58–9 (1861). The 37 species cited were determined by B. Billings, jun. (R¹.)

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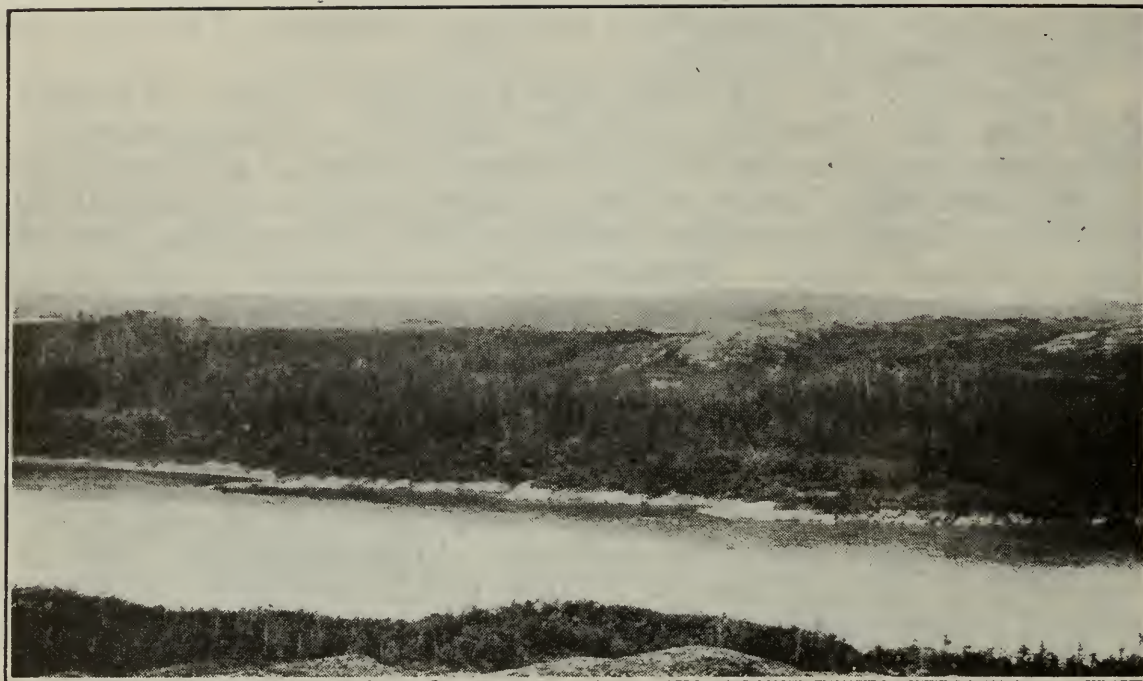
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Watt, D. A.—See Butler, Rev. S. R.

LIST OF NEW SPECIES AND VARIETIES

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A. View over Romaine (or Olomonashibou) river to the elevated tundra beyond.



B. Islands in Darby bay, near pointe au Maurier, typical of those in the Laurentian area.

PLATE III



A mountain lake on île Petit Mécatina.



A. The *Sea Star* at anchor in Shekatika bay.



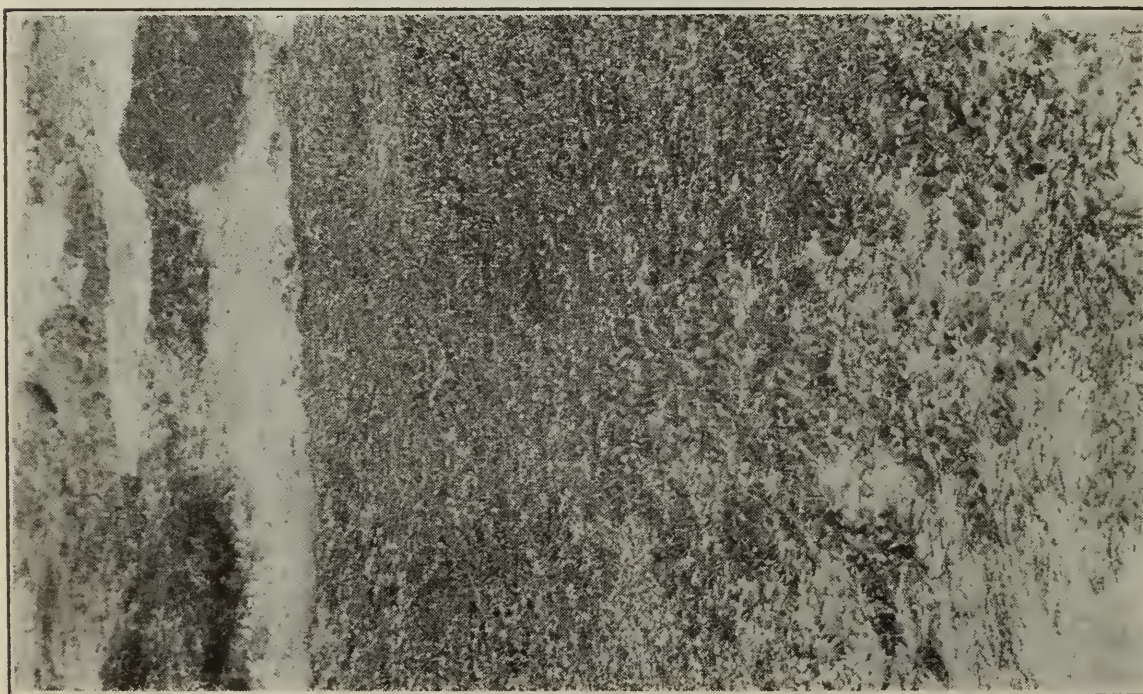
B. Valley of Shekatika river.



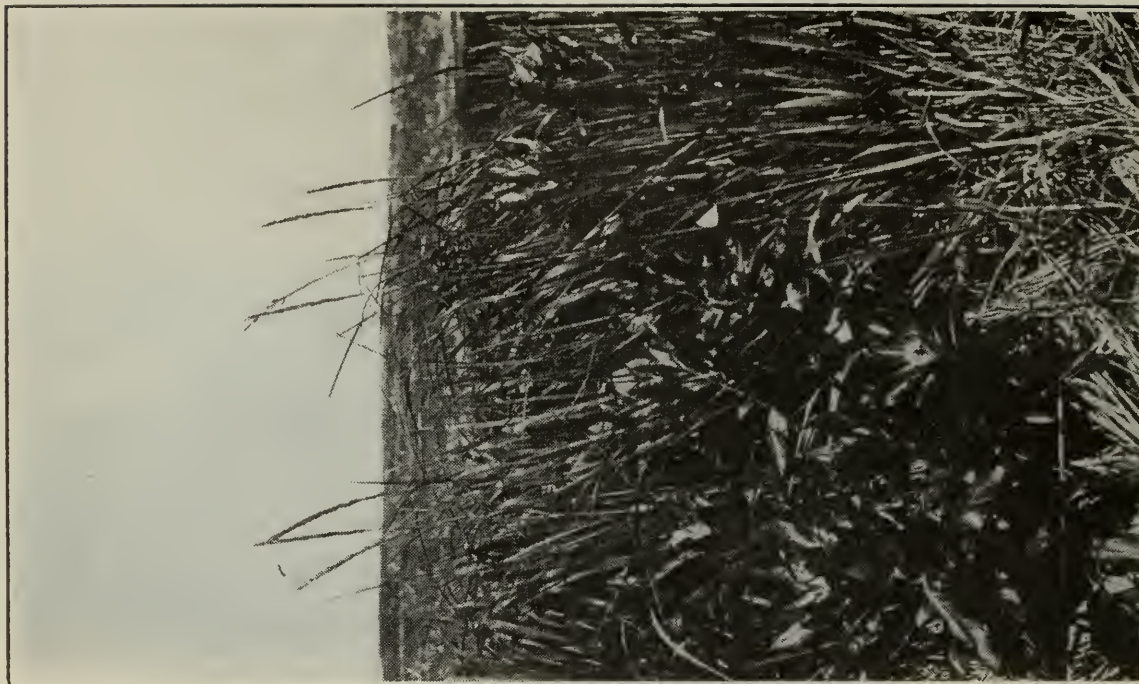
A. Calcareous tableland at Blanc-Sablon



B. Shore of île Perroquets, showing *Heracleum lanatum* and *Elymus arenarius*,
var. *villosus*.



A. Matted vegetation on the sand dunes at Blanc-Sablon, *Empetrum nigrum*, *Betula pumila*, and *Vaccinium uliginosum*.



B. Strand vegetation, *Senecio Pseudo-Arnica* and *Elymus arenarius*, var. *villosus*.

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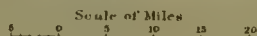
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HON SIR JAMES A LOUGHEED MINISTER, CHARLES CAMSELL ACTING DEPUTY MINISTER

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OUTLINE MAP



C.O. Seibert, Geographer and Chief Draughtsman
J.J. Carr, Draughtsman

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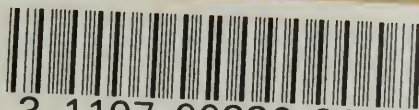
Sheet 1, - Seven Islands to Ouapitagone

To accompany Report by Harold S. John

Scale of Miles

A horizontal scale bar with markings at 0, 5, 10, 15, and 20 miles. The bar is divided into segments by vertical tick marks. The numbers 0, 5, 10, 15, and 20 are placed below the bar at regular intervals.

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